..THE IRON AGE..

ESTABLISHED 1855

NEW YORK, JUNE 30, 1932

Vol. 129, No. 26

Is a New Plant Location the Way Out?

By JOHN A. PIQUET

THE unremitting pressure of the depression has forced manufacturers to consider every possible means of reducing cost. One step, which is usually thought of last, because of the many-sided problems it involves, is removal to a new location. Factors that must be weighed in relocating a plant are outlined in the accompanying article.

THE intense price competition going on today is forcing many manufacturing concerns to consider the final and drastic step in reducing costs—moving the factory to a new location where large savings in space, labor and transportation may be possible.

Many of these manufacturers are doubtful whether they can really save any worthwhile amount by moving, consolidating several plants into one, or otherwise rearranging production geographically.

Most of the firms contacted by the writer seem to have three questions in their minds:

1. Can lower costs really be found in other cities and sections?
2. Are many manufacturers moving today, or considering a move?
3. Should our own company move, and where are we going to get the money to do it?

Great Diversity of Costs in the United States

Answering the first question, it is obvious that a large city has higher living costs or demand for labor than most small ones, with consequent higher wages. Labor is steady in one section and troublesome in another. Freight costs vary widely and are not uniform as they might be. Nearness to customers changes as new customers are gained and old ones drop out. The present plant may be old or unsuitable, while a better one elsewhere may be picked up at a bargain.

In fact, different costs and conditions are inevitable in a large country like our own, with big cities and small ones, with native labor and 20 different kinds of foreign-born workers, and with customers, materials and freight rates adding up a different equation for almost every single concern.

A difference of $10 a week for metal-workers between large and small centers is not uncommon, and the work accomplished is about the same. Factory rent may run from 50c. down to 10c. per sq. ft. per year, and the price of a vacant building from $2.50 per sq. ft. down to 30c. Nearness to certain industries may mean great savings in securing materials or selling goods or by-products.

It certainly pays a manufacturer to keep posted on costs elsewhere. He may find he belongs there.

Fewer manufacturers are moving today than formerly, largely because they do not actually know what they could save through another location, and because they feel they cannot finance the costs of moving. Other manufacturers have involved themselves in ownership of expensive plants, or do not want to leave their friends and golf clubs.

More manufacturers than probably ever before are thinking about cheaper locations for manufacturing. Any honest manufacturer with a reliable record can have his moving expenses financed or paid for by most of the towns to which he may be thinking of moving. Factory bargains abound. No matter how cheap labor may be in the big centers, it is always cheaper in the smaller cities. A manufacturer who knows his business and can handle labor in a fair and efficient way need not have great difficulty organizing a new working force in some other community.

A large manufacturer of light automotive equipment, located in New York and prospering there for years, is now planning to move to some smaller city where a better building, lower labor costs and a more central shipping location can be secured.

A metal cabinet concern in New York, which has made plenty of money there in the past, is going to move to a smaller city for the same reasons as given above.

A large foundry in New England has moved production to the surplus space of a Pennsylvania foundry, and will settle near there permanently, where costs are lower.

The Evernu Lamp Co. of Brooklyn is just completing a one-story plant of 50,000 sq. ft., to employ 150 men, in the small town of Slatington, Pa., located on the main line of the Lehigh Valley Railroad, 115 miles from New York.

This company makes household lamps, ash trays and stands and other

metal products. It sells nationally. The foundry from which it has been securing its castings is located but a few miles from Slatington, thus saving the former freight to New York. The type of labor is Pennsylvania German, a native stock unmatched for stability and hard work when fairly treated. Location on the main line insures fast service to the West, as well as to other points. Incidentally, Diesel oil engines will be used for power. A small space will be retained in Brooklyn to serve certain New York customers.

Through this move the Evernu Lamp Co. obtains a location near the source of its castings, on fast transportation to chief markets, a better laid-out plant, and workers with low living costs in a pleasant environment. As Slatington is only 20 miles from the labor center of Allentown, Pa., the company can secure additional workers should it exhaust the local supply, or lay off workers if necessary without feeling that the latter will become penniless.

Another form of relocation is to move into the plant of a competitor or allied line, thus obtaining trained labor and suitable plant or equipment. The Jackson Tube Co., Brooklyn, maker of steel tubes for metal beds, stands, velocipedes, etc., was in awkward quarters for efficient operation. Much of its business was west of New York. It bought the plant and business of the Newark Tube Co., making an allied line, and obtained a good one-story plant of 50,000 sq. ft., trained labor and the nearby presence of important customers. The moving of equipment was accomplished during the slow season in the company's own trucks, at small expense and with little loss of business.

Still another form of moving is to use surplus space in another plant. A manufacturer of gas ranges in New England, housed in old buildings in a town with high labor costs, has moved most of the production to unused space in a large foundry and machine shop concern in Pennsylvania, located in a small center near a larger city, where he finds good space, steadier labor at a lower rate, and good transportation.

The depression seems to be reviving old customs in the case of a small manufacturer of metal shop equipment, who has asked the writer if he can find a plant with water-power, located in some small town. This concern is now located in a large metropolitan area where labor, taxes and power are high. There are, in fact, many available water-powers scattered throughout the industrial sections of the country.

Ideal for seaplane manufacture. The Glenn L. Martin Co. plant, near Baltimore, on large site and airport with miles of waterfrontage on Chesapeake Bay.

New Lines of Industry Locate Economically

The newer lines of industry are naturally more free to locate where they will than old industries warped by custom and heavy investment. An example is rayon plants in the South or small centers, where labor, land and materials are low in cost.

Aviation manufacturing started up in many cities, but some of the best plants in this line have chosen what are probably among the most scientific of locations. The Glenn L. Martin Co., one of the leading manufacturers of planes, chose Baltimore as the ideal site for its purposes, because of the following reasons as given by the company:

> First, Baltimore is convenient to Washington, where both Government and private interests buy planes in quantity.
>
> Second, Baltimore is centrally located between North and South, and has a shorter freight haul to the interior of the country than any other large seaport on the Atlantic. It has ample labor of all kinds at reasonable rates.
>
> Third, Baltimore harbor in spacious Chesapeake Bay is exceptionally good for seaplane manufacture because it is free from fog or storm; temperatures are moderate and the harbor rarely has ice; the tidal range, a factor of primary importance with seaplanes, is only 14 in.
>
> Finally, the more important materials used in plane manufacture are available from convenient distances.

The Martin plant is a beautiful one-story structure located 10 miles from the center of Baltimore, on a site of 1042 acres, with airport included. The site is on a peninsula jutting into Chesapeake Bay, and has 5½ miles of waterfront on three sides. Chesapeake Bay, with 170 miles of protected inland waterway from the Atlantic Ocean north to Baltimore, offers an ideal safe route for airplanes and seaplanes, as well as a vast testing surface for seaplane manufacture.

General Aviation Corpn., a subsidiary of General Motors, is another important aviation company that located in Baltimore in recent years. While the immediate cause was the availability of the new Curtiss-Caproni airplane plant, built for the latter but never occupied, nevertheless the other causes for the location were those given above.

Every merger has to consider plant location of the right sort as an important purpose of the merger itself. An interesting example, which may result in a complete new location in the not distant future, is a merger of four companies making similar or allied lines of machinery and metal equipment of a light and medium-heavy nature. Sales efforts were consolidated. A consolidation of factory production was blocked because the four former owners wished to hang on to their old plants and not lose their identity. Two of the plants now have insufficient business to warrant two extra overheads. A third plant is in rented space that is too small and on too many floors. The fourth plant is too far away for efficient inter-company direction and transportation of product. A large extra land site as storage space and testing ground is needed. The amount of cash

MODERN one-story plant of Addressograph-Multigraph Co. at Euclid, suburb of Cleveland. Latest in straight-line production, maximum window and roof illumination.

necessary for moving, or for a new building if an old one cannot be found, has so far been held back as a reserve for dividends to stockholders. In this case, the latest word is that the declining business in the first two plants will force consolidation into one central plant in the best possible location.

When Plants Are Consolidated

In many cases companies with several plants should consolidate them under one roof. The decision depends on a study of all costs involved, including future prospects. A clear-cut case of the wisdom of consolidating production is illustrated by the action not long ago of an automotive company in the Middle West. Plant B made 11,000,000 parts yearly for Plant A, which finished and assembled them, and which was in a better shipping and marketing location. A study showed the advantages of continuous manufacture in one place, under one supervision, and the elimination of double handling and loading:

Savings yearly, through elimination of supervision, indirect labor	$ 80,000
Elimination of double handling and loading	120,000
Elimination of boilers, repairs, in Plant B	60,000
Miscellaneous and estimated	60,000
Reduction in inventory of $120,000, at 3 per cent	3,600
Saving in manufacturing cost through consolidation (estimated to amount of 5 per cent of sales price)	187,500
Total annual gross savings.	$511,100

In this case Plant B was old, and the equipment moved was light.

When Plants Should Not Be Consolidated

Another automotive concern in the Middle West had three plants. A is the large main plant in the metropolis. Plants B and C are smaller, and are located in small cities within 100 miles of A. The problem was whether to move B and C to A. A firm of engineers was engaged to make the study. The report was as shown in the table:

Increased Monthly Expense in Moving B and C to A Location

New plant required near A; cost of $1,133,750 at 6 per cent	$5,668.75	
Upkeep on old plants B and C until sold—B	4,837.80	
C	1,820.70	
Increase in direct labor rate in A over B and C, based on A—61.7c. an hour		
B 109,777 man-hours per month 40.9c.	22,833.62	
C 19,708 45.9c.	3,193.70	
Total increased expense		$38,354.57

Savings in Moving B and C to A Location

Savings in cheaper freight on all steel to A	1,387.50	
Elimination of indirect labor, etc.	5,900.00	
Total savings		7,287.50
Increased expense per month in consolidating plants		$31,067.07
Moving expense, 896 heavy machine tools, B and C to A		$126,900.00

The chief reasons for not moving the two plants to A were obviously, first, an increased payroll of over $300,000 a year; second, upkeep of two plants that might not be sold; and, third, cost of moving heavy machine tools.

Why Many New Plants Are of One-Story Construction

An important advantage of a new plant location, for many lines of industry, is the possibility of finding or building a one-story plant. The cost of such a structure is usually only 66 per cent of that of a multi-story building of the same size. It is estimated that 96 per cent of a one-story plant is usable space as against 82

(*Concluded on page* 1425)

ADVERTISING value and access to passing customers is shown by plant of the L. P. Nelson Iron Works, maker of truck bodies, road-building machinery and conveyors. Note busy highway in front, and rail siding in rear.—Near Passaic, N. J., suburb of New York.

THE FINISHING OF ROLLS BY

◆ ◆ ◆

RECENTLY a manufacturer of large steel forgings produced a roll some 60 in. in diameter by 30 ft. in length, weighing nearly 150 tons. Even today, when the industrial world is accustomed to works of large magnitude, this is a noteworthy accomplishment.

Yet it was only the outgrowth of an art that has been understood since the dawn of civilization. We have more or less authentic data that the use of rolls dates back to prehistoric times. It is entirely probable that as a means to facilitate the movement of heavy objects rollers were used by the people of the Stone Age, by the builders of Solomon's Temple, and by the Egyptians in the construction of their great pyramids. Coincidentally, rolls were used for crushing grain, and herein lies the differentiation of the two fundamental uses.

Even today, the function of rolls is divided into two general systems, those used in conveying material and those used to change the physical form of a material. We also have various combinations of the two systems, some in which both functions are combined, others where they are associated. In addition to the systems described, we have another system in which the roll introduces an additional process.

Examples of Roll Applications

The following examples will illustrate the several conditions mentioned above: Conveyor rollers are used simply to support the belt that carries the material, Fig. 1; sugar-cane crushing-rolls are used to disintegrate the cane, open up the juice cells, and squeeze out the juice, Fig. 2; a four-high rolling mill includes a pair of working rolls of small diameter which act upon the material, and these rolls are in turn backed up by backing rolls which merely take the load but do not act upon the material, Fig. 3; and the paper dryers of a paper machine which convey the unfinished paper and impart heat for drying, Fig. 4.

In summary, we might safely divide rollers and rolls into two generally accepted classes of work, rollers where transportation is effected and rolls where the material is acted upon direct. The latter application will be considered in the ensuing discussion.

Generally, rolls are cylindrical in form, with "journals" or "necks" on both ends of the "body." The necks are usually extended to include a fluted portion called a "wabbler" by which the roll is rotated (Fig. 5). The means by which rolls are rotated varies widely, some having a simple cylindrical portion with keyway, and some with a square extension, but the fluted wabbler with three or more grooves is perhaps the most common means. Journals are either for sleeve bearings or for anti-friction bearings, the latter having been developed quite recently.

As a machine element, the roll or roller is as common as any other element, and in some cases, such as rolling mills, rubber mills, etc., forms the basic part of the machine. As such, its functioning is twofold, i.e., its relationship to the other elements in the machine, and the nature of its performance upon the material to be rolled.

Metal rolling is basically a development of the forging process in which the rolls act directly upon the material. It follows, therefore, that the rolls must be strong and tough and have a hard, dense surface. It is important that this surface be smooth.

Rolls Made of Various Materials

The material of which rolls are made varies as widely as their usage. It ranges from rubber covered to the hardest tool steel, and includes such materials as granite, porous cast iron for sugar-cane crushing rolls, and chilled cast iron, and the method of manufacture is peculiar to the material.

The earliest known forms were of wood, usually a tree trunk cut to a suitable length. This was followed by stone that was chipped nearly cylindrical and gradually worn smooth by extended use.

The exact date of the introduction of metal as a material for rolls is not known, but it can safely be placed at some time prior to the beginning of the Christian era. From that time to the present the change in manufacturing methods and design of rolls has been spasmodic, sometimes undergoing no change in the basic idea for periods of a century or more.

About 1806 the old Garrison Works at Pittsburgh is said to have poured the first cast-iron roll having a chilled surface. The accomplishment was far in advance of its time, as the iron roll with a chilled surface was unsurpassed as a roll material for more than 100 years. The event, aside from its importance to the rolling mill industry, started the research into improved methods of machining hard

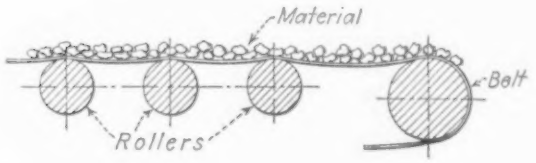


Fig. 1.—Conveyor rollers used simply to support the belt that carries the material. (Above.)

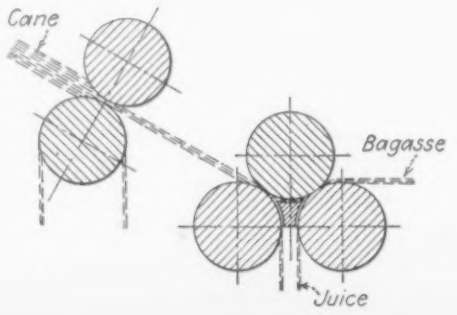


Fig. 2.—Sugar-cane crushing rolls disintegrate the cane, open up the juice cells and squeeze out the juice. (At right.)

GRINDING—I

By CARL MOREY
Consulting Engineer, Big Rapids, Mich.

GRINDING has been used for many years to produce the smooth surface so necessary on plain rolls for metal rolling. From the comparatively light, highly sensitive early machine, the roll grinder has developed, especially since the advent of alloy iron rolls, into a much heavier unit capable of roughing as well as finishing. The next step is polishing and buffing, says Mr. Morey, in this article, which, the first of a series of four, outlines also the various uses of rolls and the materials used in their making.

materials which is carried on with increasing intensity even today.

Steel Rolls Followed Chilled-Iron Product

The first material offered as an improvement on chilled iron as a roll material was steel; its use, however, was more or less limited because a surface comparable with that of chilled iron was obtainable in only the very small sizes by tempering. Even though steel gained considerable ground in the extremely large sizes, unheat-treated chilled iron was required where great density and hardness of surface was necessary in these large sizes.

Following the steel roll, the alloy irons were developed. While still limited somewhat as to size, the alloy iron rolls are the first to threaten the supremacy of chilled iron. Rolls are now produced with surfaces considerably harder than the tools used in the early part of the nineteenth century. While chilled iron is machinable, and was successfully tooled for 100 years, the new alloy rolls are classed as economically unmachinable.

Prior to the introduction of alloy iron, in fact, some 50 years ago, the grinding process was introduced as a finishing operation. This method, however, was not universally accepted until a much later date. For a great

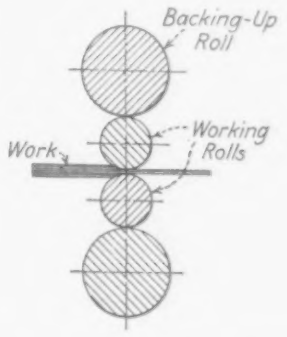


Fig. 3.—In the four-high rolling mill the pair of small diameter working rolls that act upon the material are backed up by rolls that merely take the load.

many applications, chilled iron rolls were machined to approximate size and form, later to be finished by grinding. Since the alloy iron roll must be ground rough, machines for this purpose must be very rugged. Therefore, a roll grinder of today must be a stock-removing as well as a finishing tool.

Early Roll Grinders Sensitive

As we look back over the development of the tools for finishing rolls we note that the lathes for both roughing and finishing are of the most rugged and simple type that can be devised.

The case of the grinder is somewhat different. Early roll grinders were extremely light and sensitive. Sensitiveness was built into them. This was most pronounced in the so-called "swing rest" grinder, which employed two wheels and a swinging wheel carriage.

The introduction of single-wheel machines caused a reversal of the idea and required a highly rigid machine even for finishing cuts only; and today, where the grinder is also a roughing tool, this rigidity idea is more pronounced.

Regarding the finish of rolls, the grinding methods produced a far better surface than the lathe, although it is only a question of time until the surface of rolls will be polished and buffed.

Aside from the fact that a highly polished roll surface produces better work the life of the roll surface is materially prolonged. It follows, therefore, that the polished and buffed roll is to be expected in the very near future. In fact, research along these lines is now under way by a group of the nation's most important builders of grinding and polishing equipment.

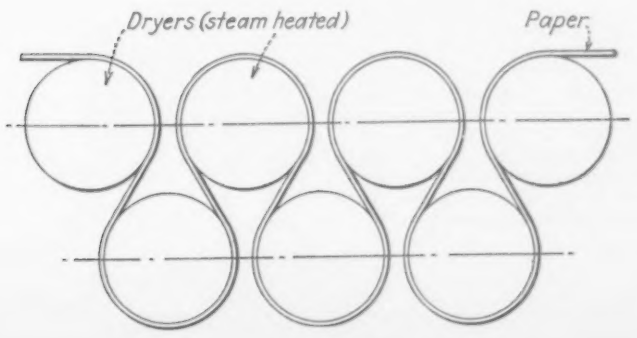


Fig. 4.—The dryers of a paper machine convey the unfinished paper and impart heat for drying. (At left.)

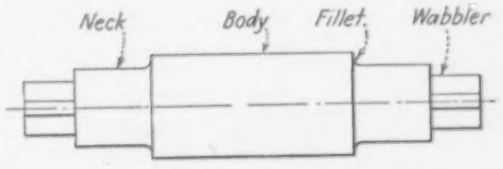
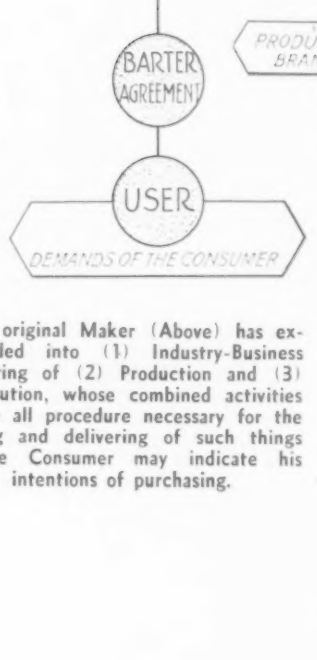


Fig. 5.—Roll necks are usually extended to include a "wabbler" by which the roll is rotated. (Above.)

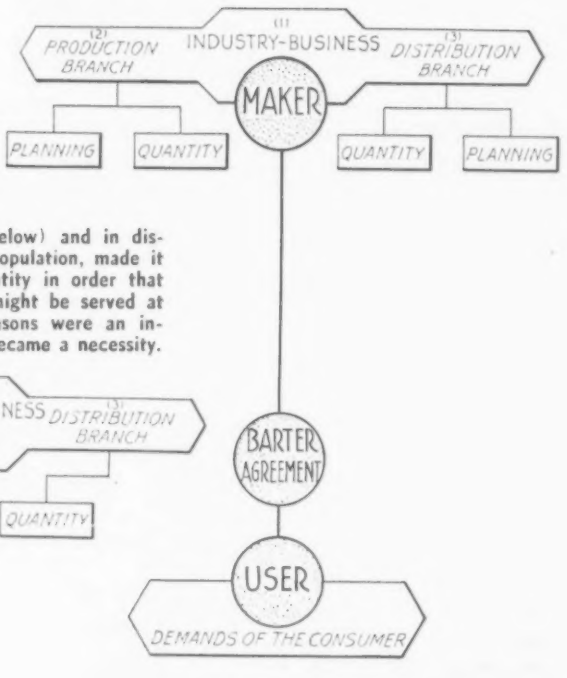
From Barter to Modern Industry

By L. M. WAITE
General Manager, Higley Machine Co.

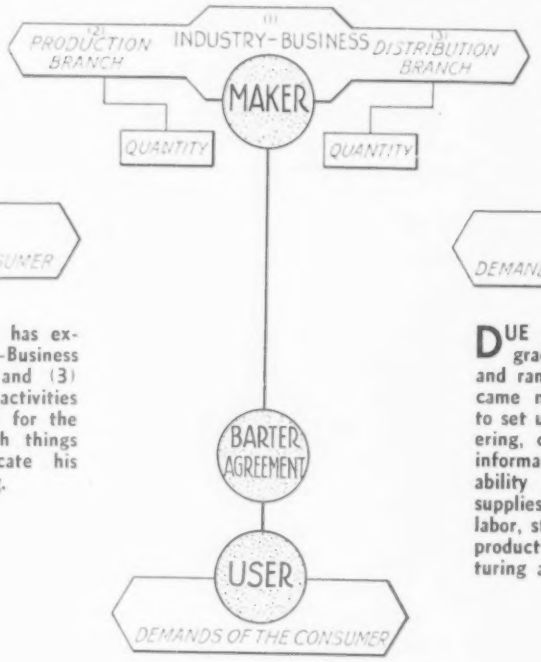
IN "Barter Days" (Above) the "Maker," in addition to producing the things used by his immediate family, made excess quantities with the intent of trading them for other things. The "Maker" traded with the "User."



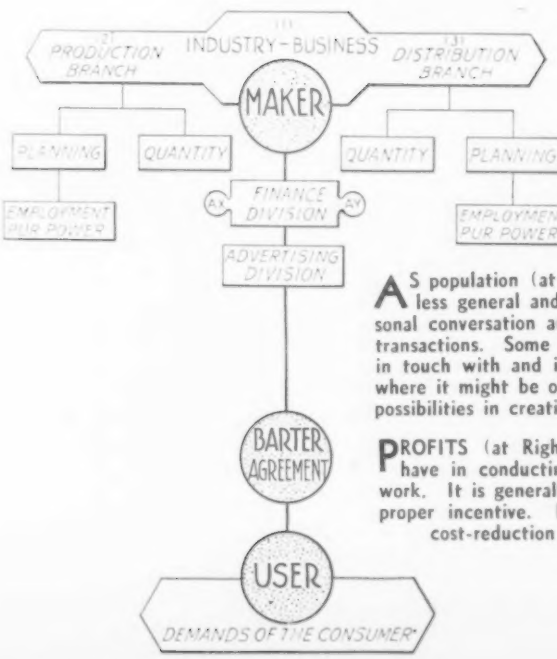
THE original Maker (Above) has expanded into (1) Industry-Business consisting of (2) Production and (3) Distribution, whose combined activities involve all procedure necessary for the making and delivering of such things as the Consumer may indicate his intentions of purchasing.



INCREASES in population (Below) and in distances separating units of population, made it necessary to produce in Quantity in order that the many, widely separated, might be served at one and the same time. Seasons were an influence. Fast transportation became a necessity.

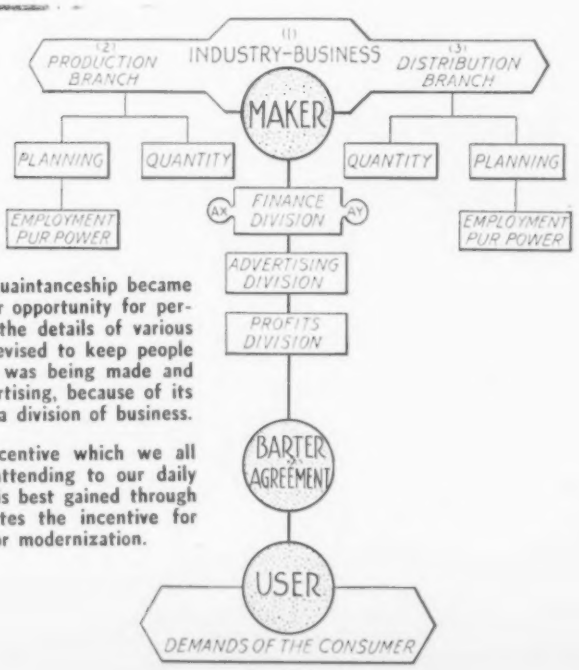


DUE to quantity (Above), quality, grades, styles, types, sizes, variety and range of things demanded, it became necessary for Industry-Business to set up a Planning Division for gathering, compiling and efficiently using information as to sources and availability of production materials and supplies, procuring equipment and labor, studying design, engineering and production methods, creating manufacturing and distribution schedules, etc.



AS population (at Left) increased, acquaintanceship became less general and there was no longer opportunity for personal conversation and agreement as to the details of various transactions. Some method had to be devised to keep people in touch with and informed as to what was being made and where it might be obtained. Thus Advertising, because of its possibilities in creating demand, became a division of business.

PROFITS (at Right) represent the incentive which we all have in conducting business and in attending to our daily work. It is generally true that success is best gained through proper incentive. Profit incentive creates the incentive for cost-reduction and the incentive for modernization.

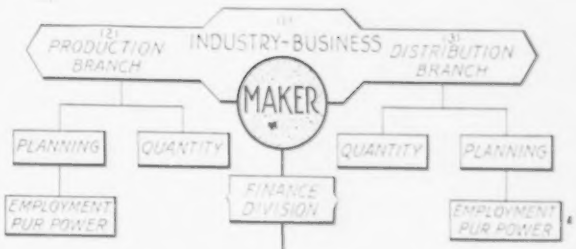


and Business

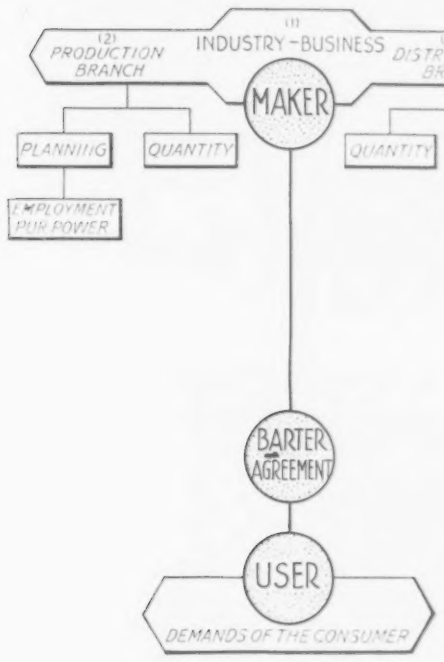
A Graphic Picture of Business Evolution Which Will Help in Thinking About Present Problems

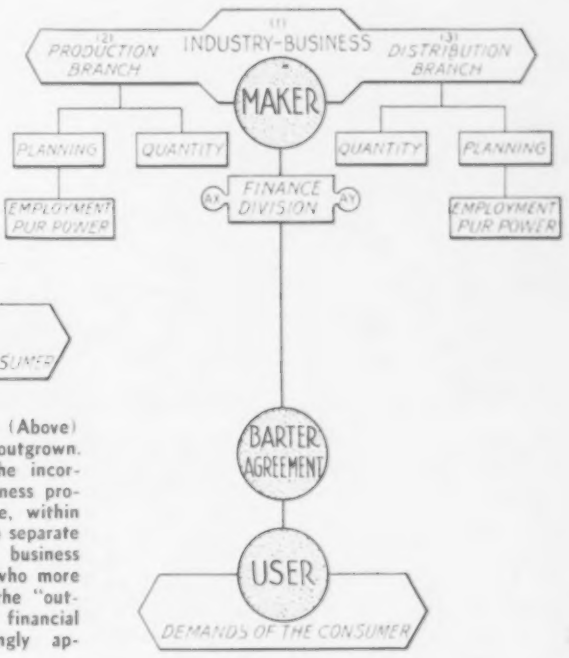
(Copyright, 1932, by The Iron Age Publishing Co.)

WHEN it was developed (Below) that wages were the greater part of the cost of serving the wants and needs of human beings, employment assumed its position as a separate department of planning. Owner and Tenant controversies of previous periods were reborn in the arguments of Capital and Labor.

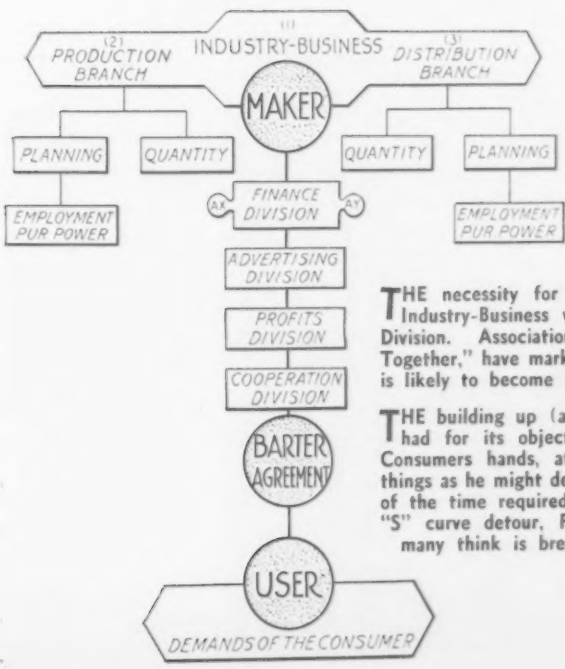


A GREATER part (Below) of the criticism of business revolves around the activities of the financial division. By no means, is all of the criticism groundless or unprovoked and it is aimed to make this fact stand out on the charts by calling attention to "Ulcers." AX and AY.



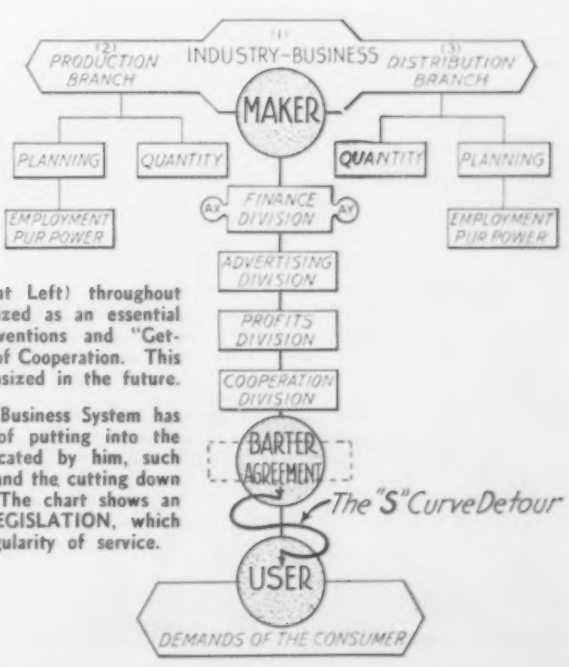


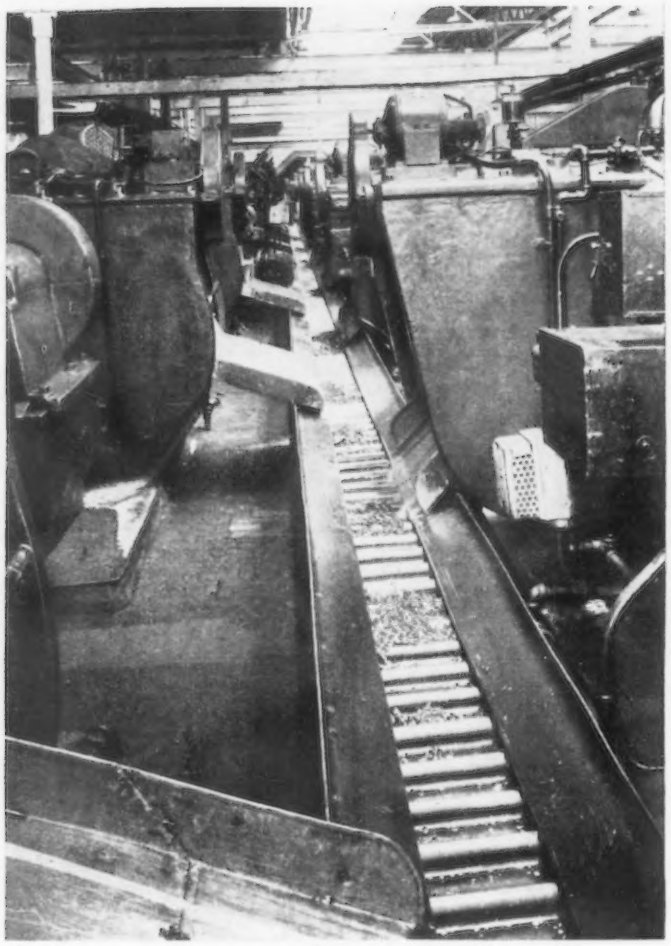
THE "shoe-string" order (Above) of financing became outgrown. Then was introduced "the incorporation method" of business procedure, tending to create, within business management, two separate thinking elements—the business man and the financier—who more or less drifted apart as the "outside" possibilities of financial power became increasingly apparent.



THE necessity for "team work" (at Left) throughout Industry-Business was early recognized as an essential Division. Associations, Unions, Conventions and "Get-Together," have marked the progress of Cooperation. This is likely to become even more emphasized in the future.

THE building up (at Right) of the Business System has had for its object the final act of putting into the Consumers hands, at the place indicated by him, such things as he might desire to purchase and the cutting down of the time required for so doing. The chart shows an "S" curve detour, PROHIBITORY LEGISLATION, which many think is breaking up the regularity of service.





▲ CHUTE extending from each machine tool discharges chips on to a conveyor which carries them to a larger conveyor running under the floor to points outside of the building.

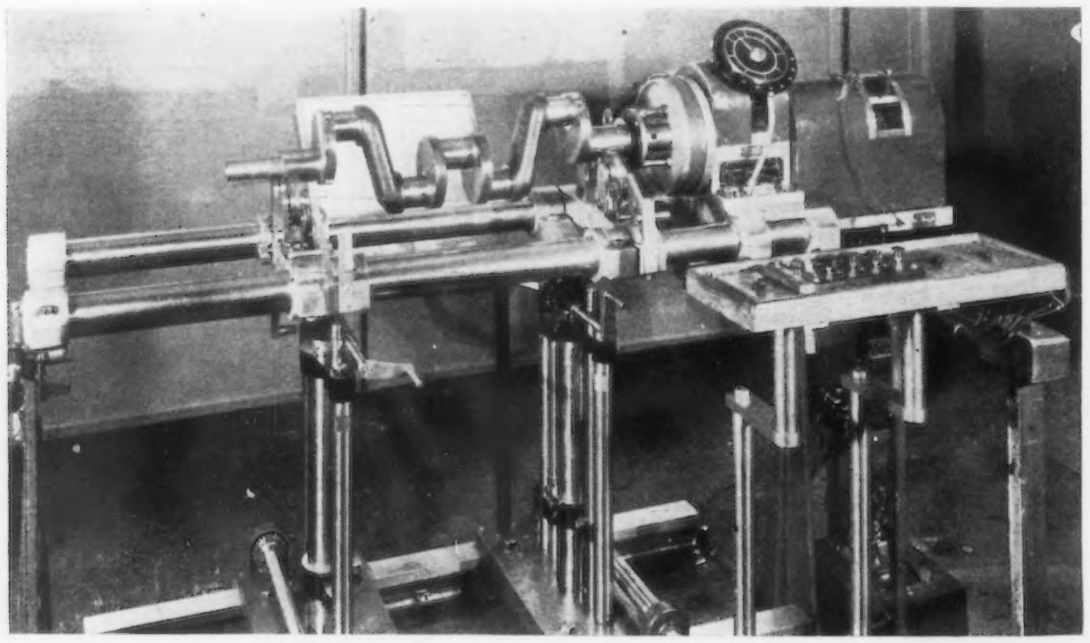
Ford V-8 Crankshaft Department Equipped for Rapid, Accurate Operation

By BURNHAM FINNEY
Detroit Editor, The Iron Age

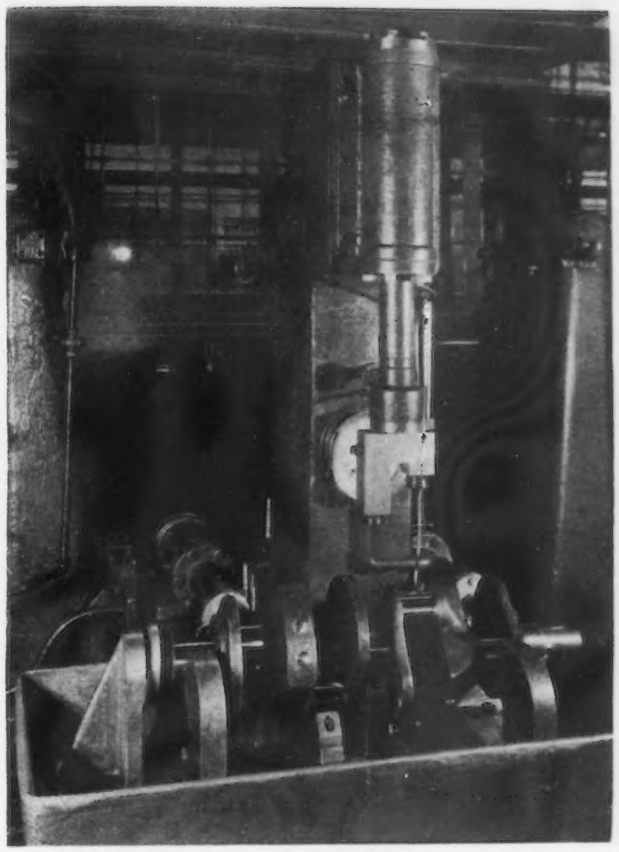
DYNAMIC balancing of the Ford V-8 crankshaft and some of the operations that immediately precede the balancing, as well as some of the efficient general facilities of the crankshaft department as a whole, are outlined in this continuation of the article on page 1349 of last week's issue.

Six holes in the flywheel flange are drilled, reamed and countersunk (four also are tapped), the front end is cut to length and a ⅝-in. hole is drilled, reamed, countersunk and tapped on a special two-way drill, all of this work being done simultaneously. Production from this machine is 35 to 40 crankshafts an hour.

In the finish grinding of the four pin bearings the crankpin grinder is equipped with a rheostat to maintain



TWENTY crankshafts an hour are dynamically balanced on this machine, which measures the amount of unbalance by means of compensating weights.



AFTER all the machining operations are completed, the oil holes in the crankshaft are flushed with kerosene under pressure of 50 lb. per sq. in. on a hydraulically-actuated machine of Ford design.

the desired surface speed of the grinding wheel. As the wheel is worn down during the grinding, the rheostat automatically increases the speed of the wheel spindle, thus giving the proper peripheral speed. The result of this arrangement is a better grind, higher efficiency from the grinding wheel and elimination of the possibility of rough bearings. This machine finishes 10 crankshafts an hour.

Keyways are milled in the crankshaft on a four-spindle vertical continuous rotary milling machine. Prior to tests for balancing, crankshafts pass through a 20-ft. long overhead-conveyor type washing machine, where they are cleaned with a soda water solution.

After all machining operations are completed, the crankshaft goes to a special Ford-designed machine which flushes all oil holes with kerosene at a pressure of 50 lb. per sq. in., washing out all abrasive material, fine chips and other foreign matter. The machine is hydraulically operated and is equipped with a pressure pump for the cleaning compound.

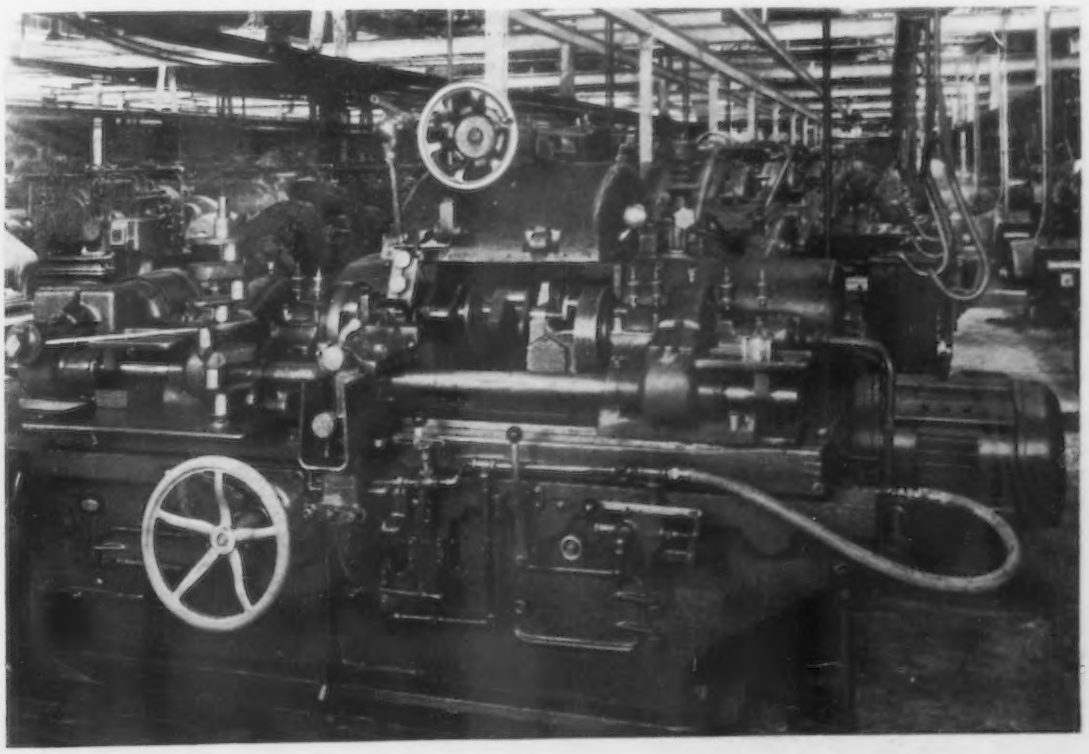
One of the machines for dynamic balancing of crankshafts measures the amount of unbalance by means of compensating weight. That is, a vernier adjusting screw is thrown off the center line, creating an unbalanced condition to counteract any unbalance in the crankshaft. From this screw the operator takes a reading corresponding to the amount of unbalance in the crankshaft. This reading then is translated on a chart which tells the exact depth of the hole required to remove the unbalance. The machine is driven by a synchronous motor operating at 285 r.p.m., and is run at a speed 20 per cent under the critical. It balances both ends of the crankshaft at a rate of 20 per hr.

In drilling holes to compensate for unbalance in the crankshaft, operators use 7/16-in. drills to assure accuracy. The allowable tolerance is so small that if a larger drill were employed, a larger error than the limits prescribe might result.

Chip Conveyor Located at Rear of Machines

As already mentioned, machine tools in the crankshaft department are arranged in parallel rows back to back. At the rear of the machines and parallel with them are conveyors built into the floor for carrying away chips. A metal chute extending from each machine discharges the chips on to this conveyor. All of these conveyors in turn deliver chips to a similar but

(*Concluded on page* 1426)



THE crankpin grinder for finish grinding the four pin bearings is equipped with a rheostat to maintain constant the surface speed of the grinding wheel. The rheostat operates automatically as the wheel wears down, increasing the speed of the wheel spindle to maintain the predetermined peripheral speed.

Large Attendance Marks Meeting of Iron and Steel Electrical Engineers

FEATURED by a large exhibit of new developments in the iron and steel industry, and with technical sessions devoted to mechanical, electrical, lubrication, combustion and safety engineering programs, the twenty-eighth annual convention of the Association of Iron and Steel Electrical Engineers was held at the William Penn Hotel, Pittsburgh, June 20 to 23. Attendance at the technical sessions and the exposition totaled at least 4000.

An instructive display of major and auxiliary electrical equipment and related apparatus of interest to the steel industry was staged by some 45 exhibitors at the exposition. Working models of ingot stripper cranes, soaking pit and ladle cranes were displayed and photronic tube control demonstrations attracted considerable attention. Roller bearings for 4-high mills were shown after having withstood the rolling of over 400,000 tons of sections. Lubricating systems and devices as well as special lubricants for rolling mill service were among other exhibits of interest to visiting steel mill engineers.

Review of Technical Papers

The technical sessions were well attended and the papers presented covered a wide variety of topics of interest to both makers and users of steel mill equipment.

W. H. Burr, electrical superintendent of Lukens Steel Co., Coatesville, Pa., reviewed the problems and accomplishments of 1931 as affecting steel mill electrification. But 63 main roll drives were sold during 1931, or about half the number of the year preceding. Of this total, comprising 119,325 h.p., Russia took approximately 20 per cent. The principal development of the past year, in Mr. Burr's opinion, has been the application of alternating current squirrel-cage motors to roller and catcher-tables on sheet and tin mills. Increase in the use of welding as applied to the fabrication of crane parts was also characterized as an important development.

Proposes Use of Electric Arc for De-seaming of Slabs

A. F. Davis, vice-president, Lincoln Electric Co., Cleveland, advocated the use of the carbon arc for de-seaming of slabs and billets. He stated that seams can be welded at a speed of from two to five ft. per min., and that the cost of the operation, taking into account the saving of metal, will be only about one-half that of the usual chipping or gas-burning methods.

In the process described an arc is struck between a carbon electrode and the slab or billet, at one end of the seam. The arc is concentrated in a small area on the metal by means of a magnetic field induced by a coil. A special fiber rope, called the "autogenizer" is fed into the arc, and in burning gives off a gas which forms a protective atmosphere around the arc. The electrode holder is mounted in a suitable carriage, supported in a miniature two-legged bridge structure which straddles the slab. The bridge is motor driven, and the carriage may be moved in either direction along the bridge, to cause the arc to follow the seam.

It is claimed that the arc will weld together the edges of the seam, and that regardless of the depth of the seam it is necessary to weld to a depth of only about ⅛ in. If the seam extends below this, it was stated that the action of the arc and surrounding gases will cause the elimination of any oxides or impurities in the crack, leaving the adjacent surfaces, beneath the weld, so clean that they weld together in subsequent rolling operations. The change in chemical composition of the fused metal is very slight, only ten to fifteen points of carbon in a 0.50 carbon steel. To date the method has been used in an experimental way only, but the results look very promising.

Ladle Crane Practice

Some interesting facts regarding the practice of various steel mills in inspecting and replacing the cables on hot metal handling cranes were brought out at one of the sessions by F. W. Cramer, chief electrical engineer, Republic Steel Corpn., Youngstown, Ohio, and chairman of the ladle crane committee. Replies to questionnaires sent to 49 plants showed that over 50 per cent of the ladle cranes in these mills are overloaded, in some cases by as much as 40 per cent of the rating. This is rather surprising, as the first consideration in handling hot metal is safety. The average life of cables reported was eight months, with a maximum of 24 and a minimum of three months. The frequency of inspection of the cables varies from once a day to once a month. In only five of the plants reporting is it the practice to have the crane hold the ladle while the heat is being tapped. It would seem that this general change from the practice of ten years ago should increase the life of the cables, as the intense heat and flame while tapping the furnace must have a detrimental effect. About one-half the plants use cables with steel cores, and one-half hemp cores.

A great deal of attention is given to the proper design of drums and sheave wheels. In modern cranes the sheaves are frequently made of hard manganese steel, and are mounted on roller bearings. The use of so-called safety cables, and equalizer sheaves, is being quite largely discontinued.

In discussing the returns from the questionnaires, a representative of a cable manufacturer warned against the general practice of overloading ladle cranes. Such overloading decreases the factor of safety, and safety is the prime requisite in handling hot metal. The desirability of adopting some standard method of reeving the cable on the drums and sheaves was suggested. If possible, reverse bends of the cable should be avoided. Small diameter sheaves cause the cable to wear rapidly. This is especially true of equalizer sheaves, which are usually so located that it is difficult to inspect and lubricate the cable passing around them. They should be eliminated whenever possible. It is recommended that cables with steel centers be used if the crane must hold the ladle during the tapping period. A hemp center may char in such service.

Crane manufacturers' representatives stated that in practice it is usually necessary to reverse the rope travel, but that this has little ill effect if the sheaves are of sufficiently large diameter. The sheave should be from 30 to 40 times the diameter of the cable for best results.

The improvements which have been made in design of sheaves, reeving, etc., in modern cranes indicate the possibility of obtaining a cable life of a year or more.

Electronic Tubes

Three interesting papers describing various applications of photo-electric and other types of electronic tubes were presented by engineers from the General Electric Co., Schenectady, the Westinghouse Electric & Mfg. Co., East Pittsburgh, and Weston Electrical Instrument Corpn., Philadelphia. The photo-electric tube, which

is sensitive to light rays, may be used as a flag switch to initiate the operation of tables, shears, or other auxiliaries. Mechanical flags often cause cobbles in thin strip or similar material, but even the thinnest piece of metal can intercept a light beam with no difficulty. The photo-tube may be made to turn lights off or on as the natural illumination increases or decreases. It can detect the presence of smoke, or warn if the smoke from a stack is so dense as to indicate improper combustion in the furnace.

The photo-tube makes an excellent pyrometer for temperatures above 1500 deg. Fahr. The current passing through the tube is proportional to the amount of radiation received by it, and this, in turn, varies with the temperature of the object which the tube is "looking at." It is only necessary to place an ammeter in the output circuit of the tube and calibrate this in terms of temperature. The device operates successfully at all ordinary temperatures above 1500 deg. Fahr. The amount of radiation from bodies below this temperature is not sufficient to give reliable results.

Reducing Furnace Operating Costs and Scaling Losses

Several interesting papers were presented at the meeting of the combustion engineering division of the association. H. Dobrin, consulting engineer, emphasized that even under the present very much reduced rate of operation it is possible to obtain reasonably low fuel costs, if proper attention is given to all details of furnace operation. Several rather remarkable instances of substantial savings were cited.

In one plant the fuel used in the open hearth and auxiliaries in 1928 was about 8,200,000 B.t.u. a ton per month. In 1931, with a very much lower tonnage rate, and consequent greater fuel losses due to shut-downs, the fuel consumption was reduced to about 5,400,000 B.t.u. per year. In another open hearth plant a fuel consumption of 6,640,000 B.t.u. a ton per year in 1929, including auxiliaries such as ladle heating, etc., was reduced to 5,640,000 in 1931, with only about 30 per cent of the tonnage of 1929.

In another mill the fuel used for sheet normalizing in 1928 was about 3,860,000 B.t.u. per ton. In 1931 only 2,518,000 B.t.u. were used per ton. The fuel for box annealing of sheets, which in 1929 amounted to approximately 1,920,000 B.t.u. per ton, was cut to 1,750,000 B.t.u. in 1931, with only about one-half the tonnage. All of these savings were brought about by close attention to furnace operation and upkeep. Such matters as reducing air infiltration, preventing air and gas leaks, controlling air supply by proper regulation of dampers, heat insulation of checker chambers, and attention to flue gas analysis, all had a part in making these savings possible.

D. W. Murphy, of the University of Michigan, analyzed the various factors which influence the scaling of steel at forging and rolling temperatures. His conclusions are that the loss due to scaling increases with the length of time the steel is at temperature; that the rate of scaling increases with the velocity of the gas stream passing over the steel, up to about 10 ft. per min.; that the loss increases with the temperature, rising very rapidly when the melting point of the scale, about 2500 deg. Fahr., is reached; that the loss increases in the presence of free oxygen and that as little as 0.1 per cent of sulphur dioxide in the products of combustion has a serious effect in increasing the loss.

▲ ▲ ▲

New Officers and Directors of the A.I.S.E.E.

PRESIDENT, J. D. Donovan, Republic Steel Corpn., Massillon, Ohio.

FIRST VICE-PRESIDENT, W. E. Miller, Bethlehem Steel Co., Johnstown, Pa.

SECOND VICE-PRESIDENT, W. H. Burr, Lukens Steel Co., Coatesville, Pa.

TREASURER, J. H. Van Campen, Republic Steel Corpn., Youngstown, Ohio.

SECRETARY, J. A. Clauss, Great Lakes Steel Corpn., Detroit.

DIRECTOR-AT-LARGE, G. R. Carroll, Jones & Laughlin Steel Corpn., Aliquippa, Pa.

DIRECTORS: H. D. Esterly, Alan Wood Steel Co., Conshohocken, Pa.; E. C. Marshall, Youngstown Sheet & Tube Co., Indiana Harbor, Ind.; R. F. Sanner, Carnegie Steel Co., Duquesne, Pa.; W. H. Gilbert, Tennessee Coal & Iron Co., Fairfield, Ala.; A. D. Adams, Spang Chalfant & Co., Inc., Pittsburgh; J. L. Miller, Carnegie Steel Co., Youngstown, Ohio; P. F. Haberstick, Wheeling Steel Corpn., Wheeling, W. Va., A. L. Foell, Arthur G. McKee & Co., Cleveland.

▼ ▼ ▼

Determining Rolling Mill Power Requirements

In a paper presented by Harry A. Winne, of the General Electric Co., there was described in considerable detail a method for determining the capacity of motors for main roll drives.

The basis of the system is a large amount of data which has been collected from tests made in existing motor driven mills. These data are plotted in the form of a number of so-called "power curves," showing the relation between total elongations of the metal, and total horsepower hours per ton of metal rolled. To determine the power needed to drive a proposed mill, the curve is selected which most nearly fits the conditions. Then from the rolling schedule and mill data, the elongations after each pass are calculated, and the corresponding values of horsepower hours per ton are read from the curve. From the weight of the piece, and the time required for each pass, the horsepower required by the stand during the pass can be then easily calculated.

After determining the power needed during the actual rolling of the pass, the motor capacity may be selected. Care must be used to insure that the motor has sufficient continuous capacity to take care of the root-mean-square of the duty cycle, and sufficient overload capacity to handle the power needed during the pass. Standard main roll motors of the synchronous or induction type usually have a guaranteed maximum load capacity of 250 per cent of their normal rating. However, it is wise to allow a certain factor of safety to take care of cold steel and improper drafting, so it is best to select the motor such that the maximum calculated peak-load will not exceed 175 per cent of the normal rating. Similarly, while main-roll direct current, adjustable speed motors usually are guaranteed to carry 200 per cent rated load for one minute, it is best to use a motor such that the calculated peak load does not exceed 150 per cent of the normal rating.

The very important effect of temperature and analysis of the steel in the amount of power required to roll it was emphasized. A decrease of 200 deg. or 300 deg. Fahr. may double the amount of power needed. It seems quite probable that many mills are not giving sufficient attention to proper heating, and are not aware of the importance of its effect in their power costs.

Roll Neck Bearings and Their Lubrication

At the meeting of the lubrication division of the Association of Iron and Steel Electrical Engineers, a great deal of interest was expressed in the subject of non-metallic roll neck bearings, particularly those made up of a cloth or paper base, materially bonded with a phenolic resin, such as Bakelite. A number of these bearings are in the market, under various trade names, such as Celoron, Glyco, Micarta, Synthane and Textolite.

W. B. Shirk, steel mill engineer of the Westinghouse Electric & Mfg. Co., East Pittsburgh, presented a paper describing the application of "Micarta" to roll neck bearings. Records have been kept on mills using "Micarta" bearings, according to the author, which have shown a reduction in kilowatt hours, per ton of energy amounting to from 10 to 20 per cent.

There appears to be some difference of opinion among the manufacturers as to whether it is better to have the laminations of paper or cloth perpendicular to or parallel to the surface of the journal. Water is recommended as a lubricant, with occasional use of a grease, such as tallow, particularly just before the mill is shut down. The application of the grease materially reduces the starting friction, which otherwise might be high.

Bearings of this type must not be subjected to temperatures above 300 deg. Fahr., but it was stated that they will operate, with proper lubrication, at pressures up to 3000 lb. per sq. in.,

and at journal speeds from about 200 to 2500 ft. per min.

It is claimed that the application of these non-metallic bearings has in many cases materially reduced friction losses, resulting in power savings of as much as 15 to 30 per cent.

Mr. Dahlstrom, of the Morgan Construction Co., described a special sleeve type of metallic roll neck bearing, with provision for complete lubrication. He stated that the friction loss is of the same general order as in roller bearings, and that so far no limit had been found to the allowable bearing pressure, even at speeds as low as 1 r.p.m.

W. D. Hodson, of the Hodson Corporation, made a plea for more careful attention to the lubrication of roll necks, both in the design and operation of rolling mills. He stated that the use of the proper lubricants and lubricating devices would make very great savings in mill operations.

Ornamental Iron Shops to Hold Trade Conference

WASHINGTON, June 28.—Fabricators of ornamental iron, bronze and wire have been authorized by the Federal Trade Commission to hold a trade practice conference, the time and place to be determined. Commissioner C. W. Hunt will preside. Trade practices so far proposed for discussion include the following:

Unauthorized substitution of material; use of methods of fabrication and erection not in accordance with applicable Government laws; selling goods below cost; secret rebates and "shopping around" for lower bids after having secured the "lowest" bid, resulting in lowering the standards and quality of electrical installation and building construction.

Members of the industry fabricate and install such articles as hangars, fire escapes, stairs, railings, grilles, elevator fronts and enclosures, store fronts, lamp standards, balconies, coal chutes, mail chutes, sidewalk doors, etc. In 1929 the production was about $156,000,000 and in 1931 it was about one-half that amount. The fabricators are situated in widely separated parts of the country and have local trade associations in New York, Philadelphia, Boston, Baltimore, Chicago, Detroit, Cleveland and St. Louis.

Stephens-Adamson Mfg. Co. of Canada, Belleville, Ont., has concluded an arrangement with the Orton Crane & Shovel Co., Huntington, Ind., for the manufacture and sale in Canada of Orton locomotive cranes, dipper shovels, pull back ditchers, skimmers, clamshell and orange peel buckets, traveling gantry and cantilever cranes and similar equipment. Sales and engineering offices are located at 926 Bank of Hamilton Building, Toronto, and at 220 New Birks Building, Montreal, with sales representatives in the large cities of other provinces.

Testing Society Holds Annual Meeting at Atlantic City

THE thirty-fifth annual meeting of the American Society for Testing Materials, held at Atlantic City, June 20 to 24, was one of the smallest in a number of years. The registered attendance was about 60 per cent of normal as judged by recent conventions held in that place. Despite this, however, the many activities of that important organization continued to function successfully and smoothly, although some familiar workers were unable to attend, handicapping the work of certain committees and limiting the discussion of papers. The contrast with the record meeting of last June in Chicago was marked.

The usual committee reports were made at the various sessions, dealing largely with specifications. There were a number of important technical papers interspersed with the committee reports at the 14 main sessions of the week. Besides these there were over 140 meetings of various committees and sub-committees. The technical feature of the week was the symposium on steel castings. And among committee reports mention should be made of one by the joint research committee on the effect of temperature on the properties of metals.

The annual report of the executive committee, the society's governing body, made public at one of the sessions, reveals a loss in membership for the year ended June 1, 1932, of 365, or about 8½ per cent. The year 1931 was a successful one and there is a favorable balance of about $5,000, so that there will be no curtailment for the year in publications. For the coming year every effort is being made to meet conditions with the expenditure of less money.

The seventh Edgar Marburg lecture, established in memory of the society's last secretary, was delivered this year by Prof. Hugh Scott Taylor of Princeton University. His subject was "Fundamental Problems of Resistance to Deterioration." It was a masterly exposition of factors which influence the speed of chemical reactions, with some practical references to methods now used to slow down or inhibit such reactions as involve deterioration of materials such as rubber, paper and other important industrial products.

As has been customary for a few years, the Charles B. Dudley medal was awarded this year to the author whose paper at the last (1931) convention of the society was considered the most outstanding by a special committee. The recipient this year is C. A. Menzel, associate engineer, research laboratory, Portland Cement Association, Chicago, in recognition of his paper "Tests of Fire Resistance and Stability of Walls of Concrete Masonry Units," delivered at the Chicago conventon last June.

The medal was presented at the annual dinner, at which officers for 1932-1933 were introduced and at which the retiring president, F. O. Clements, delivered his annual address, entitled "Research and the American Society for Testing Materials."

NEW OFFICERS

PRESIDENT:

Cloyd M. Chapman,
consulting engineer,
New York.

VICE-PRESIDENT:

W. H. Bassett,
metallurgical manager,
American Brass Co.,
Waterbury, Conn.

NEW MEMBERS OF EXECUTIVE COMMITTEE:

H. A. Gardner, chemical engineer,
Institute of Paint and Varnish Research,
Washington.

J. O. Leech,
assistant metallurgical engineer,
Carnegie Steel Co.,
Pittsburgh.

J. T. Mackenzie, chief chemist,
American Cast Iron Pipe Co.,
Birmingham.

J. C. Ramage, engineer of tests,
Southern Railway Co.,
Alexandria, Va.

H. S. Vassar, laboratory engineer,
Public Service Electric & Gas Co.,
Irvington, N. J.

Technical Progress and New Specifications

ONLY a few of the many important committee reports and technical contributions can be touched on in this limited survey.

Metals at High Temperatures

Of outstanding prominence and impressiveness was the report of the joint research committee of the A.S.M.E. and the A.S.T.M. on the effect of temperature on metals. In presenting the report, the chairman, H. J. French, International Nickel

(*Continued on advertising page* 16)

How Depressions End

By C. E. WRIGHT
Markets and News Editor, The Iron Age

PROBABLY no two of our major financial and industrial depressions have come to their end in exactly the same way. In fact, opinions might vary with respect to past depressions as to what particular event or chain of events was directly responsible for the first impulses toward recovery. It is noteworthy, however, that a study of the history of depression periods reveals that the restoration of confidence was the mainspring of renewed activity. In all former periods of stagnation financial and political uncertainties were uppermost in postponing the return of confidence, as they are now. The striking similarity between present conditions and those of other days are shown by excerpts from reports of the American Iron and Steel Association (predecessor of the American Iron and Steel Institute).

Following the panic of the early nineties there was a one-year recovery upon which the American Iron and Steel Association commented as follows in its report for 1895:

". . . the increased confidence in the future and the improvement in business which were observable in the early months of 1895 were due to the purchase by the Government of over $60,000,000 in gold in February, which it was hoped would check further exports of gold, and to the final adjournment of the Fifty-third Congress in March, and the consequent ending for the time being of tariff agitation and of revolutionary financial schemes. . . . The annual report was scarcely printed on May 15, 1895, until there was everywhere perceptible throughout the country a more hopeful feeling than had been described. Three weeks had brought increased confidence in all business circles. Industrial activity had been quickened in March and April, but with the coming of May it had been greatly stimulated. Gold had ceased to go abroad. In June even those who had been most discouraged were convinced that the year would be one of at least moderate prosperity for most of the great industries of the country. Thenceforward the fact was everywhere accepted that a revival of prosperity had actually commenced."

There was a secondary slump, however, in 1896. The association report said that the "boom" of 1895 had "collapsed because it fell into the hands of speculators and because the country as a whole was not prosperous under the Wilson tariff. In the spring months of 1896 dullness and declining prices again characterized the whole American iron trade, as well as other home industries."

During the depression of the nineties it was a common observation that productive capacity in farm products and in manufactured articles was beyond the world's needs. However, a crop failure abroad in 1897 and a large surplus in the United States brought back prosperity in that year. "Wheat rose to over a dollar a bushel before the end of the year. Railroad securities advanced in price in consequence of the increased traffic resulting from increased demand for agricultural and other products." Iron and steel business improved, but without a corresponding gain in prices until fall. Output of iron and steel in 1897 was the largest in our history up to that time.

In 1908, following the panic of 1907, the American Iron and Steel Association declared that the agitation for tariff revision combined with the results of political meddling and financial mismanagement "to prevent the restoration of industrial prosperity." At that time it was the fear of tariff revision by Congress that prolonged the uncertainty following the 1907 depression. By 1909, however, "the panic had done its worst, its financial scars had been largely healed, and in the spring of 1909 it became known that the new tariff would not contain as many downward changes in duties as the President had desired. When the tariff bill finally passed both Houses and became a law on Aug. 5, confidence in financial circles had been completely reestablished, industrial activity had been everywhere fully restored, and the country had started upon an era of prosperity which has continued to this day, the abundant crops of 1909 contributing to this welcome condition. . . . The iron trade was the first of the great manufacturing industries to experience the new industrial awakening, production in all its leading branches steadily increasing from month to month after February, 1909, when the turn in the tide may be said to have commenced. . . . The rebound in the iron trade in the early part of 1909 from the depression following the panic of 1907 was marvelous in its intensity and results."

Black despair of every major depression has been followed by a renewal of activity which has carried production to greater heights than had been attained before such catastrophes. Yet in every major depression there have been the same fears, the same uncertainties and the same misgivings as to productive facilities having overtaken consumption requirements. In 1909 it was stated in these iron and steel reports that "it is an alarming proposition that the railroads of this country can be operated only under conditions which subject them to the absolute control of the general Government," yet in later years the railroads reached their greatest period of prosperity. It was also stated at that time that "control of the railroads may be a prelude to the control of the manufacturing and mining industries of the whole country," another example of the unreasonable fears that mold our thinking in times of great stress.

Depressions to some extent wear themselves out, but actual improvement usually depends upon some physical or psychological factor, very often an unexpected one. It is apparent, however, that we must first look for financial stability as an essential prerequisite of that confidence which is necessary to resumption of industrial activity. This may come about through cessation of gold exports, through the ending of agitation over currency inflation and bond issues for unwarranted public expenditures, and the possible adjournment of Congress after it has completed its emergency legislation. Within the month considerable progress has been made toward the attainment of these stabilizing factors. Confidence is slowly coming back, even though business has not yet made the turn.

Overhanging Double-Crank Presses Made of Welded Steel

THE Henry & Wright Mfg. Co., Hartford, Conn., has added to its welded steel press line a new series, of which the No. 25½ overhanging double-crank press illustrated is typical.

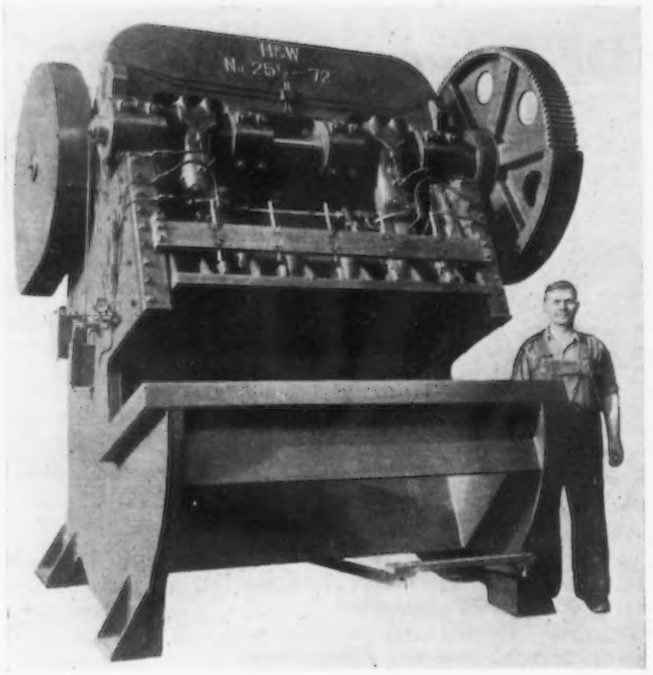
This machine is inclined in a fixed position of 25 deg. so that large blanks, such as automobile running boards, etc., produced in compound dies, can slide by gravity to a conveyor at the rear. Frame, slide and main gear are of steel and are fabricated by welding and carefully normalized and annealed to eliminate stresses set up in either the rolling or welding processes.

A feature emphasized is the frame design. The throat is inclined with respect to the center line of the slide and has large radii at top and bottom, as in the welded steel inclinable presses introduced last year by the Henry & Wright company. Photoelastic tests of this throat design are said to show that stress concentration is reduced to a minimum as compared with the throat parallel with the center of slide and small radii at the top and bottom of the throat. This, it is claimed, results in a much more uniform stress distribution throughout the frame, but particularly at the throat. The ribbing in the frame is designed to give maximum rigidity even under extremely severe eccentric loads.

The crankshaft is made from a hammered alloy steel forging, heat treated and ground, and is mounted in bronze bushed bearings. The slide is guided in extra long ways, the pressure side of the latter being bronze lined, while the gibs are made of close-grained alloy iron. The welded gear has a high-carbon steel rim, and is driven by a heat treated 0.50 per cent carbon steel forged pinion. The drive shaft is equipped with Timken roller bearings mounted in cartridges.

Automatic pressure lubrication is supplied to all principal bearings by the system shown, the pump and reservoir of which is located on the frame and driven from the crankshaft. The amount of lubricant furnished each bearing can be adjusted to suit conditions, and the time of application can be varied from every 7 to 60 min. for each bearing.

Principal dimensions are: Opening through frame, 72 in.; area of bed, 30 x 85 in.; opening in bed, 15 x 56 in.; area of slide face, 24 x 66½ in.; shut height, bed to slide, stroke down, adjustment up, 15½ in., and thickness of bolster, 3½ in. The stroke is 4 in. and the number of strokes a minute is 35. The net weight of the machine shown is 30,000 lb.



THROAT design to assure more uniform distribution of stress throughout the frame, and particularly at the throat, is a feature of these new welded steel gap frame presses.

Steel Floor Armoring Easily Applied

ACME Floor-Steel, furnished in rolls containing approximately 100 sq. ft., is used as reinforcing in the construction of concrete, hot and cold asphalt mastic, magnesite and other types of poured floors, as well as for resurfacing old floors. It is also used over wood with a suitable filling material.

The floor armoring is rolled out like a carpet. The concrete base course has been laid in the usual manner, and has been struck off ⅝ in. below the finished floor line. The finishing coat is poured into the matting and leveled off flush, leaving the top edges of the steel exposed.

After the rolls are laid upon the floor base, they are easily and quickly joined into a mat, continuous in all directions, by a simple system of pin connections and wire splices. Filling material is poured on the matting and the floor is leveled off, leaving the top edges of the steel exposed in the surface to take the wear. As truck wheels and loads pound and grind over the floor, the exposed edges of the steel become slightly peened over, or mushroomed in effect, presenting an increased area of steel in the floor. The result is a non-skid floor. Cracks, holes and ruts, which slow up traffic and create accident hazards, are avoided, it is stated. The floor armoring is manufactured by the Acme Steel Co., 2840 Archer Avenue, Chicago.

Large Machine Parts Made of Welded Steel

Welded steel frames, bases and other parts of large presses, shears and other machinery are pictured and briefly described in a 24-page bulletin recently put out by the Lukenweld, Inc., division of the Lukens Steel Co., Coatesville, Pa. An interesting example of this welded steel construction is the frame of a 500-ton forging press which was designed to meet a requirement of 0.012 in. maximum permissible deflection between crankshaft and bed under a 500-ton load. The side members of this frame are made from 4½-in. thick steel plate. Gear cases, pump and motor and other bases, gear and sprocket blanks, large jigs, billet boxes and carriers, ladle stands, soaking pit covers, crane trolleys and girders are among other welded steel pieces shown.

Designs Vertical Internal Grinder for Large Work

THE new vertical internal grinder being introduced by the Heald Machine Co., Worcester, Mass., is designed for accurate operation on large work, particularly work that is awkward to handle, or that cannot be handled in a horizontal position without too much overhang. It will grind straight or taper, internally or externally, as well as face grind. Furthermore, if necessary it will finish the bore, outside diameter and face of the work at one setting, assuring that all surfaces will be true as regards each other.

Two sizes of the machine, 36 in. and 48 in., are built; in each size five different column heights are available, giving clearance of 15, 18, 24, 30 and 38 in., respectively, between the diamond and the faceplate. Both machines can be furnished with either a 22-in. or a 31-in. grinding stroke.

Arrangement of the machine may be seen in the illustration, which shows the 36-in. machine, equipped with a 36-in. faceplate. The wheelhead drive is by belt and idler pulley, which is necessary where a considerable range of spindle speeds is required. In the case of large heavy-duty spindles with larger grinding wheels, however, the wheelhead would be coupled directly to the motor.

The vertical wheelhead slide is operated hydraulically and controlled from a valve arrangement at the right of the head. An elevator lock prevents falling of the slide when the hydraulic system is shut off with the machine idle. Slide speed is controlled from the throttle lever *A* and slide reversal by lever *B*. Manual movement of the slide is through handwheel *C*, which is thrown in and out by moving lever *D*. The wheelhead slide of the standard machine may be set up to 15 deg. on the side, or 30 deg. included angle. The graduated plate provided to facilitate this setting is at large radius, and reads with a vernier to 2 min. of angularity.

Vertical Slide Counterbalanced Hydraulically

The entire vertical slide is counterbalanced hydraulically by an arrangement of valves. Stroke is set by the two dogs, *E*, and for bringing the wheel out of the grinding position, a lever arrangement that operates a lift latch on the lower dog is employed. The hydraulic counterbalancing is emphasized providing uniform slide speed at any particular throttle opening, also as equalizing the hand effort required to move the slide up or down.

Wheel drive is by a 25-hp. motor mounted on the wheel slide. An independent motor is employed for hydraulic system, driving a pump located on the lower right-hand side of the column. The entire vertical slide is lubricated automatically.

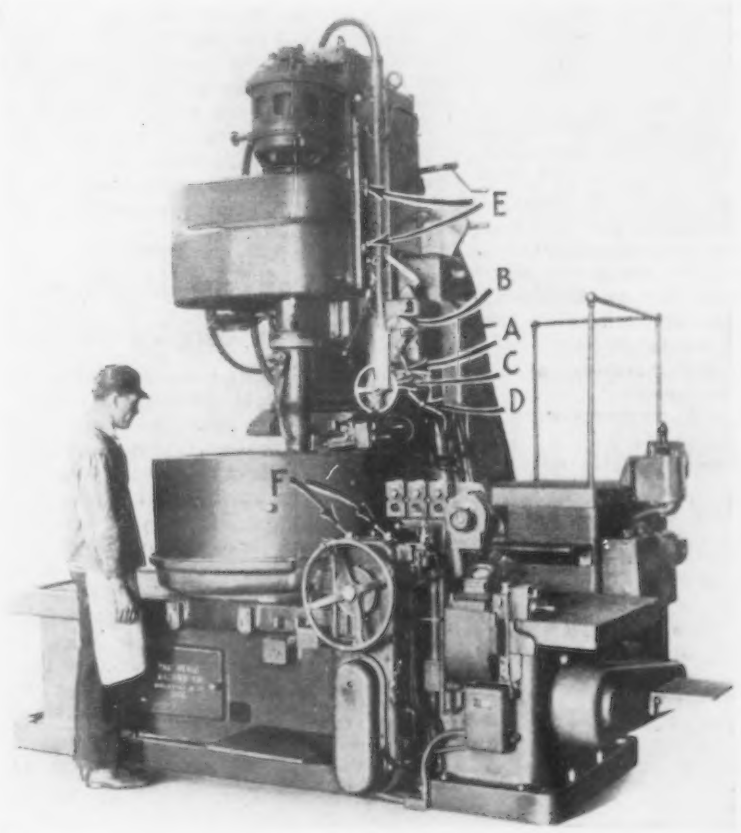
A 5-hp, variable-speed direct-current motor located at the right-hand end of the base drives the chuck through a Texrope drive and worm gear arrangement. A suitable range of speeds is provided. The chuck spindle is in two sections connected by a floating coupling so that the chuck merely floats on the top bearing instead of being connected directly to the drive. Force feed lubrication is provided through a separate pump and oil tank under the table forming a self contained unit that travels back and forth with the chuck.

In loading the machine, the table is moved several feet to the left of the grinding position in which it is shown in the illustration, thus permitting unrestricted use of a crane in handling the work. The table is driven automatically by a small motor in the enclosure on the base directly below the handwheel.

For continuous production operation, the machine may be equipped with a dial indicator for size control. At each return from the loading position, the work is repositioned automatically in relation to the wheel. After loading, the table is rapidly traversed back into the approximate grinding position, the wheel drops into position and the feeds engage. Operating of the handwheel for bringing the wheel in contact with the work is the same as in other Heald automatic internals.

Grinding is done on the right-hand side of the hole when facing the machine. An interlock prevents engagement of the rapid traverse during grinding, and also disconnects the handwheel during the rapid traverse. Table feed is hydraulic and can be made to operate either at one end of the stroke or at both ends. Amount of feed is controlled by the levers *F*, each of which controls one direction of feed. An interlock permits only one lever to be engaged at a time. Feed of the table is toward the left for the grinding of holes and toward the right for grinding the outside diameter. For the latter, the chuck may be run in the reverse direction.

This new vertical internal grinder is designated as the No. 90. The 36-in. machine illustrated weighs approximately 15 tons; it is 12 ft. high and occupies floor space of 9 x 12 ft.



IF necessary, the machine can be used to grind the bore and outside diameter and face the work at the same setting. For production work, it carries a dial indicator for size control. The machine illustrated is equipped with a 36-in. faceplate.

Electrode-Holder Stand Saves Power

AN electrode-holder stand which automatically shuts down the welding machine 1 min. after the holder is placed on stand and starts the welder instantly when holder is removed has been brought out by the Lincoln Electric Co., Cleveland. It is claimed that by shutting the machine down when the operator is not actually welding, the device saves power and raises the overall power factor of the plant.

Operation of the stand is simple. When the hook is depressed by the weight of the holder a special timing device operates, disconnecting the welder from the power supply line at the end of 1 min. When the holder is removed from the hook the welder starts automatically. The stand is of arc welded steel construction. The holder hook can be raised or lowered on the upright member to suit the convenience of the operator. Rubber covered, two-conductor cable is provided with stand for connection to welder. The electrode-holder stand can be used whenever the welding equipment is provided with an automatic motor starter having two-wire pilot control.

Screw, Nut and Stud Setter Operates Rapidly

UNUSUALLY rapid and convenient operation are advantages claimed for the "Rightway" electrically-operated screw, nut and stud setter recently placed on the market by the Foster Machine Co., Elkhart, Ind. Driving tension is quickly adjusted from the outside, and after the proper tension is determined, each nut, screw or stud is set with uniform tension. Three different types of the machine are made: the flexible shaft, the telescoping sleeve and the pedestal type, respectively.

The flexible shaft type is said to be particularly convenient for use where the nuts, screws and studs are widely spaced. The socket end of the shaft is provided with push button control, as shown, the operator handling the shaft with ease, and quickly locating the member to be driven. There is said to be no shock to the operator when the nut or stud reaches the predetermined tension. Operating on 220 or 440-volt polyphase alternating current, the machines may be plugged into the regular power line.

The telescoping type setter is designed for use where it is desirable to mount the driver directly above the work. The telescoping sleeve of this machine has a travel of 6 in., and the operator simply lowers and raises this sleeve while the entire weight of the driving unit is suspended from above. The pedestal type machine is equipped with casters.

Small Forming Press Exerts Pressure of 14 Tons

A SMALL press brake adapted for rapid forming of sheet metal sections such as used in stoves, refrigerators, metal furniture, steel cabinets and boxes, etc., has been placed on the market by the Dreis & Krump Mfg. Co., Seventy-fourth Street and Loomis Boulevard, Chicago. Although smaller than usual, this machine, powered by a ¾-hp. motor, is said to be powerful enough to do much of the work done on heavier machines of this type. Die holders are standard and the same dies can be used as on large press brakes.

The machine is made of steel throughout, including the bull gear and pinions. The bed is made up of two plates spaced ¾ in. apart, permitting the punchings to drop to the floor. All bearings are bronze bushed except the eccentric straps which are nickel cast. A single-plate friction clutch is built integral with the flywheel and operated by a foot treadle. A brake works automatically with the clutch. By releasing the treadle the ram can be stopped at any point of the up or down stroke. The driving motor, mounted on an adjustable hinged bracket, drives the flywheel by means of V-belts. Adjustments for various heights of dies can be made through large set screws at each end of the machine which raise and lower the bed to the desired height. Multiple punching attachments, angle cutting, notching and bending dies have been developed for the machine.

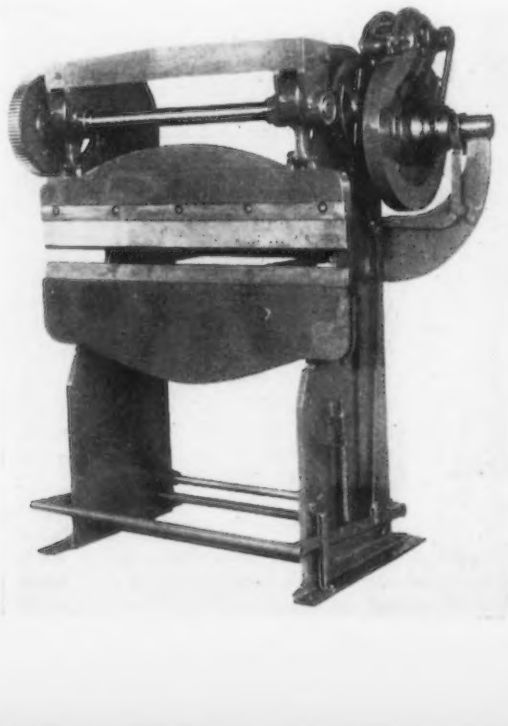
Specifications include: Distance between housings, 37 in.; length of bed and ram, 50 in.; gap in housings, 6 in.; pressure exerted, 14 tons; stroke, 2 in.; adjustment, 3 in.; die space, 6 in.; and strokes per min. 40. The machine measures 39 in. front to back, 62 in. right to left and is 71 in. high. It weighs 2100 lb.

Rubber roadways are promised by latex, the milk of the rubber tree, according to a narrative of scientific and technical developments made public by the American Chemical Society. Rubber pavings that could be applied in the same manner as asphalt have been tried experimentally in Singapore; a somewhat similar use is said to be in compositions for filling expansion joints. The many other possible uses include light rubber board for airplanes and in the manufacture of low permeability fabrics for dirigibles.

SIMPLICITY of operation features the Lincoln electrode-holder stand.

THE driving tension is quickly adjustable from the outside, and the screw, nut or stud is set with uniform tension. A telescoping sleeve-type unit is also built.

SHEET metal sections such as used in making metal furniture, etc., may be formed rapidly on the small Dreis & Krump press shown below.



MONEY SAVING IDEAS

Saves with Tungsten Carbide Cutters

AN unusual form of economy unexpectedly was developed through the adoption of tungsten carbide cutters in a plant manufacturing manganese steel points for mining tools. Part of the machines in one shop were equipped with tungsten carbide cutting tools and the superintendent subsequently noticed that his electric light bill was lower. He happened to speak of this to a representative of the electric light company and he was told it was the result of a better power factor. The tools in the shop were all single motor drive and it seems that by shifting the work to a few of these tools operated at high speed and therefore bringing a heavier load on to the motors, the power factor was so much increased that it compensated for the actual increase in total load.

Time Study Reveals Waste Motion

WHENEVER a foreman has a little extra time on his hands he might do well to make a detailed time study of the various operations in his shop. One foreman in a general machine shop recently made such a study and found to his surprise that the set-up time often exceeded the actual time of machining. He also found that the time required to transfer parts from one operation to the next was disproportionately long. Using his time study as a basis this foreman was able to rearrange tools and reallocate work to effect many substantial savings.

Variable Speed for Hammer

MOST automatically timed manual operations are at a constant rate. Often such an unvarying rate is unavoidable as in the case of a conveyor which acts as a pacemaker for successive operations. In other cases a constant rate is imposed by mechanical considerations alone and these may be changed if operating conditions warrant. This has been done to advantage by a jobbing forge shop which on a large amount of work operates its hammers on an automatic stroke basis with the timing of the stroke used as a pace setter for the operator. An ingenious variable speed device has been introduced to speed up the stroke toward the end of the forging operation without interfering with a relatively slow stroke required during the initial forming. This variable speed feature has been effected by a cam contact mechanism. By using different cams different speed variations are secured as required for different forgings.

CUTTING CORNERS

How to save money in manufacturing? How to cut corners and do things with less expense and less effort? These questions are uppermost in the minds of most plant managers today and this page is offered in the hope that it will help some to find the answers. Your comments and the account of some of your own short cuts are invited. Please address Forum Editor, Iron Age Publishing Co., 239 West 39th Street, New York City.

Felt Coated Steel Sheets

A MANUFACTURER of steel eyeglass cases has reduced manufacturing costs by buying plush and felt coated sheets and putting these through forming operations very much as he previously had done with the bare sheets. The result is a felt lined box produced without the usual costly hand operation of gluing the felt lining into place. Recently the Milton Institute of Industrial Research has announced the development of a new type of felt coated steel and this material suggests many new uses.

Finds Advantage in Grading Welds

A LARGE manufacturer employing several hundred welders has overcome one of the principal difficulties in developing new operators through the grading of all welds. The product manufactured by this company has some 78 individual welds. These are all graded according to the difficulty and importance of each weld. The new operators start in on the easy and less important welds and are gradually moved up to the higher grades. This has proved an excellent means of developing skill and the method also furnishes an additional incentive to the worker while on the lower grades. Compensation increases gradually with the increase in the grade of weld.

Self-Measuring Wire Screen

A MANUFACTURER of wire screen has increased his sales by introducing a cloth tape into the weave at the edge of household wire screening. He reports that hardware dealers and consumers both like this new convenience which reduces selling time and gives added assurance of accurate length. This is an excellent example of increased sales appeal due to an inexpensive but ingenious addition.

Automatic Hook for Welding Torch

WHEN a welding operator has finished his weld it sometimes happens that he does not know what to do with his torch. To solve such a problem a manufacturer employing a large number of welders has installed a convenient overhead hook for each operator. The hook has automatic shut-off and ignition features. When the torch is hung up it automatically shuts off the supply of gas and oxygen; then when the torch is removed from the hook, a pilot light ignites the flame as the supply of gases is released. An appreciable saving in gas consumption is reported for this type of hook and, in addition, there is the greatly increased safety feature of having all torches extinguished when not actually in use.

Automatic Feature for Grinding

AS a means of economy a manufacturer of valve parts has put a group of grinding machines under the direction of one operator by installing an automatic shut down feature. The work is of such an accurate character that it was found inadvisable to use full automatic grinders and therefore an automatic shut down feature was introduced to operate when the grinding had reached about 0.001 in. of finished dimension. From this point on the operator grinds to finish dimension by frequent hand checking with accurate gages. The operations of the various machines is staggered so that while the operator is hand grinding on one the automatic grinding is progressing on the others. If conditions are such that two or more of the other machines shut down no particular harm is done.

Selecting the Right Alloy

WITH the great number of alloys available the manufacturer is often puzzled to select the one best suited to his needs. A manufacturer of steam turbines made a scientific investigation to determine a suitable alloy for turbine blades. The following points were considered in making his selection. Resistance to erosion from steam at high velocity, resistance to vibration, strength to withstand centrifugal force, ability to hold strength at high temperature, corrosion resistance and cost. Tests were made with a copper zinc alloy, with copper clad steel, phosphor bronze and manganese copper and finally a 5 per cent nickel steel was adopted as best suited to meet all the conditions.

To Discuss Management of Small Industries

The second annual conference on management problems of the smaller industries will be held at Silver Bay on Lake George, N. Y., from July 11 to 15. The general theme of this conference will be the new levels of management effectiveness and the job ahead, and papers will cover problems of management in plants of 500 or fewer employees, budgeting for adequate profits, incentive plans in smaller industries, industrial stabilization, relief, and the economic problems of employees.

Among the organizations cooperating is the management division of the American Society of Mechanical Engineers. Presiding at the opening session will be Ralph E. Flanders, vice-president of the society. The Silver Bay Industrial Institute, sponsor of the conference, has quarters at 347 Madison Avenue, New York.

Expects Wider Use of Indium Metal

Discovery of rich ore deposits will bring indium into commerce, Dr. W. S. Murray, Utica, N. Y., reports to the American Chemical Society, New York. This metal, first known in 1863, and named indium because of the indigo-blue lines in its spectrum, has been removed from the ore electrolytically and by volatilization.

"By careful and systematic search of all known ores, a district has been found which has very rich indium ore deposits," Doctor Murray says. "By concentration, the ore has been made to yield a very high percentage of its indium content. These deposits will furnish substantial amounts of this element."

Indium, it is said, would seem to have uses in automotive, electrical, jewelry manufacture and other fields.

Technical Employment Service Without Fee

The Engineers' Club of Philadelphia, supported by the Philadelphia chapters of twelve affiliated engineering societies, has organized the Philadelphia Technical Service Committee to assist the employer of technical talent to secure men and the unemployed engineer to find employment. This committee has a cooperative arrangement with the Pennsylvania State Employment Commission.

Some 850 men are now registered with the committee, and the list includes executives, plant engineers, production engineers, process technicians, as well as salesmen, purchasing agents, designers, draftsmen and chemists.

In addition to the placement service, a job consultation service is offered. Upon request, a technical employment specialist of wide experience will help the prospective employer to prepare his job specifications. This is to aid him in securing the best the field affords for the handling of his technical problems. The committee's headquarters are at the Engineers' Club, 1317 Spruce Street, Philadelphia, and its facilities are available without cost to either employer or employee.

German Export Duties on Used Machinery

WASHINGTON, June 28.—Export duties on used machinery, except textile machinery, ranging from 15 to 80 reichsmarks per 100 kilos to rates ranging from 7 to 25 reichsmarks per 100 kilos, became effective June 25 by a German Government decree, according to a cablegram from H. Lawrence Groves, commercial attaché at Berlin. The export duty of 800 reichsmarks per 100 kilos on used textile machinery and parts remains unchanged.

Colorado Fuel Urges Use of Railroads

The Colorado Fuel & Iron Co., Denver, Colo., is attaching the following in the form of a sticker to all of its letters:

The prosperity of this country is largely dependent on the purchases made and wages paid by the railroad companies. Therefore, we strongly urge that the railroads be used whenever possible.—The Colorado Fuel & Iron Co.

Asks Investigation of Foreign Pipe Costs

WASHINGTON, June 28.—A resolution by Senator Costigan, Democrat, Colorado, directs the Tariff Commission to make an investigation under the Hawley-Smoot flexible provision as to the difference in the costs of production of cast iron pipe and fittings in the United States and foreign countries.

Propose International Debt and Tariff Meeting

A proposal that the President should initiate negotiations for an international conference on war debts, reparations, tariffs and other basic problems underlying the depression was recently presented for their opinions to bankers, business executives, economists and educators. The questionnaire was sent out by Dr. Nicholas Murray Butler, president, Columbia University, and a summary of the views has now been issued by George W. Wickersham on behalf of the League of Nations Association, of which he is president.

The reply made by George M. Verity, chairman, American Rolling Mill Co., Middletown, Ohio, appears to reflect the opinion of the great majority of the 55 answers received, and is as follows:

The proposed international economic conference is tremendously enheartening. If our experiences to date have not taught us the interdependence of nations as well as of groups we are slow to learn. In the midst of the most serious world crisis ever known we should certainly lay political thought and procedure aside and deal with international as well as home problems in a businesslike way and in the best interest of world recovery. I firmly believe international debts, reparations and tariffs are vital to such recovery, that we have an enormous interest in the manner of their settlement and that we should be willing to deal with them openly and directly. Irrespective of what further may be done at home to meet the problems of readjustment I do not see how we can have return to anything like normal conditions until the whole problem of Europe's debt to us is settled in some reasonably satisfactory manner.

Large Public Contract for Motor Trucks

WASHINGTON, June 28.—Contracts involving the expenditure of more than $500,000 for the purchase of motor truck chassis to be delivered to new post offices throughout the country were awarded last week by Postmaster General Brown. The International Harvester Co., Fort Wayne, Ind., was awarded the contract for furnishing 300 chassis of 5200 lb., each, and the White Co., Cleveland, was awarded the contract to furnish 275 chassis of 8000 lb. each and 160 chassis of 12,000 lb. each.

Cast Pipe Output Fell Sharply in 1931

The 1931 production of cast iron pipe and fittings totalled 1,179,436 net tons, valued at $45,406,096, according to compilations by the Bureau of the Census, based on returns from 73 plants, The 1929 output by 72 reporting plants was 1,692,852 tons, valued at $74,615,420. The 1931 production was made up as follows: Ball and spigot pipe, 842,311 tons, valued at $26,704,333; flanged pipe, 9733 tons, valued at $601,165; culvert pipe, 26,307 tons, valued at $1,220,478; cast iron fittings for gas and water pipe and cast iron screw fittings, 52,306 tons, valued at $4,954,566; soil and plumbers' pipe and fittings, 248,779 tons, valued at $11,925,554.

Iron and Steel Imports Rose in May; Exports, Exclusive of Scrap, Declined

WASHINGTON, June 28.—Exports of iron and steel products from the United States in May totaled 80,477 gross tons, of which 45,000 tons, or 55.9 per cent, consisted of scrap. Leaving this raw material out, exports were only 35,477 tons. The outgoing movement in April was 58,118 tons. The gain in May was therefore 38 per cent. But with the April scrap movement of 19,047 tons omitted, the total in that month was 39,071 tons or 3594 tons in excess of a comparable movement in May.

Of the scrap exports in May, Japan took 41,922 tons; Canada, 2036 tons, and Italy, 508 tons.

Imports in May were 39,751 tons, a gain of 3412 tons over those in April. With a total of 16,819 tons, the incoming movement of pig iron was approximately 42 per cent of the May receipts, the Netherlands supplying 7077 tons; the United Kingdom, 5718 tons, and India, 4019 tons.

Finished Steel Imports Recede

Imports of rolled and finished steel, at 17,723 tons in May, compared with 22,682 tons in April. Exports of rolled and finished steel in May, at 27,354 tons, were likewise smaller, compar-

Imports of Iron and Steel Products into the United States

(In Gross Tons)

	May		Five Months Ended May	
	1932	1931	1932	1931
Pig iron	16,819	10,057	60,599	46,490
Sponge iron	....	....	51	209
Ferromanganese and spiegeleisen*	3,047	1,708	11,351	13,156
Ferrochrome†	22	15	101	71
Ferrosilicon‡	12	65	32	515
Other ferroalloys	100	....	639	610
Scrap	1,950	1,497	3,958	6,307
Pig iron, ferroalloys and scrap	*21,950*	*13,342*	*76,731*	*67,358*
Steel ingots, blooms, billets, etc	34	1,582	2,017	10,004
Wire rods	388	669	3,466	3,401
Semi-finished steel	*422*	*2,251*	*5,483*	*13,405*
Concrete reinforcement bars	4,508	3,554	15,960	18,479
Hollow bar and drill steel	54	149	314	623
Merchant steel bars	2,076	2,371	15,948	19,777
Iron slabs	....	19	....	40
Iron bars	22	33	256	337
Boiler and other plate	9	3	95	627
Sheets, skelp and saw plate	1,975	2,296	9,356	9,453
Tin plate	392	4	7,148	52
Structural shapes	2,905	6,221	15,295	30,817
Sheet piling	....	123	....	579
Rails and rail fastenings	513	214	1,673	3,620
Welded pipe	252	809	2,000	2,872
Other pipe	382	343	1,417	4,878
Barbed wire	909	606	6,575	2,639
Round iron and steel wire	183	258	996	1,281
Flat wire and strip steel	85	48	367	282
Wire rope and strand	217	160	833	861
Other wire	69	16	361	308
Hoops and bands	1,989	1,390	9,262	7,959
Nails, tacks and staples	751	750	4,273	3,097
Bolts, nuts and rivets	10	72	65	518
Other finished steel	6	180	33	204
Rolled and finished steel	*17,723*	*21,690*	*97,677*	*122,504*
Cast iron pipe and fittings	....	1,696	23	4,173
Castings and forgings	72	268	448	884
Total	39,751	37,176	174,912	195,123

*Manganese content only.
†Chromium content only.
‡Silicon content only.

Exports of Iron and Steel from the United States

(In Gross Tons)

	May		Five Months Ended May	
	1932	1931	1932	1931
Pig iron	191	812	1,289	2,447
Ferromanganese	....	1	13	15
Scrap	45,000	13,231	93,758	66,006
Pig iron, ferroalloys and scrap	*45,191*	*14,044*	*95,060*	*68,468*
Ingots, blooms, billets, sheet bar	690	240	1,166	2,023
Skelp	4,200	5,752	10,976	29,574
Wire rods	1,048	4,532	8,535	18,027
Semi-finished steel	*5,938*	*10,524*	*20,677*	*49,624*
Steel bars	1,227	3,282	7,837	22,114
Alloy steel bars	161	317	834	2,262
Iron bars	84	104	238	443
Plates, iron and steel	812	5,338	5,539	24,370
Sheets, galvanized steel	2,194	6,071	12,252	21,616
Sheets, galvanized iron	98	426	645	2,911
Sheets, black steel	5,091	8,703	18,551	43,668
Sheets, black iron	296	743	1,538	3,798
Hoops, bands, strip steel	2,208	3,066	10,281	17,237
Tin plate; terne plate	2,212	6,129	16,695	37,865
Structural shapes, plain material	1,285	7,548	7,186	45,902
Structural material, fabricated	1,420	3,418	6,821	20,916
Tanks, steel	72	688	1,247	7,926
Steel rails	1,171	3,190	6,267	17,220
Rail fastenings, switches, frogs, etc	256	574	2,062	3,311
Boiler tubes	115	581	1,038	3,772
Casing and oil-line pipe	2,049	4,161	6,354	14,537
Pipe, black and galvanized, welded steel	2,506	4,055	12,290	19,819
Pipe, black and galvanized, welded iron	449	554	2,073	2,274
Plain wire	696	1,181	4,953	6,458
Barbed wire and woven wire fencing	1,732	3,028	9,254	13,069
Wire cloth and screening	67	86	277	420
Wire rope	135	254	767	1,329
Wire nails	496	585	3,570	3,604
Other nails and tacks	316	323	1,708	1,739
Horseshoes	1	22	29	33
Bolts, nuts, rivets and washers, except track	205	495	1,183	2,534
Rolled and finished steel	*27,354*	*64,922*	*141,489*	*341,147*
Cast iron pipe and fittings	440	2,320	4,747	12,494
Malleable iron screwed fittings	245	468	788	2,712
Car wheels and axles	285	620	1,456	3,373
Iron castings	242	308	899	2,309
Steel castings	151	260	624	2,050
Forgings	290	889	1,955	4,087
Castings and forgings	*1,653*	*4,865*	*10,469*	*27,025*
All other	341	691	1,979	3,420
Total	80,477	95,046	269,674	489,684

United States Imports of Pig Iron by Countries of Shipment

(In Gross Tons)

	May		Five Months Ended May	
	1932	1931	1932	1931
United Kingdom	5,718	160	10,318	1,345
British India	4,019	9,252	19,391	36,177
Germany	....	52	135	52
Netherlands	7,077	187	29,577	4,895
Canada	....	....	138	....
France	....	....	....	25
Belgium	....	100	200	100
Norway	....	....	....	86
Sweden	5	90	259	3,077
All others	....	207	581	733
Total	16,819	10,057	60,599	46,490

Sources of American Imports of Iron Ore

(In Gross Tons)

	May		Five Months Ended May	
	1932	1931	1932	1931
Canada	430	....	728	9
Cuba	....	....	55,000	23,000
Chile	43,304	70,596	175,188	418,521
Spain	....	....	49	28,337
Sweden	....	....	7,037	37,223
French Africa	3,625	20,780	10,000	40,382
Russia	15,900	76,291	81,610	165,585
Other countries	16,845	26,730	52,574	57,479
Total	80,104	194,397	382,186	770,536

ing with an April total of 32,098 tons.

Black steel sheets, amounting to 5091 tons, constituted the largest item of exportation, Canada taking 4209 tons. Skelp was the next to largest item, 4200 tons, of which Canada took 4193 tons. Of the 2049 tons of casing and oil line pipe exported, Argentina took 2018 tons, Canada took 503 tons and Venezuela, 483 tons, of the 1227 tons of merchant steel bars exported, and Japan was supplied 694 tons of the 1048 tons of wire rods shipped abroad. Exports of hoops, bands and strip steel were 2208 tons, of which Canada took 1447 tons. Of the 2212 tons of tin plate exported, 1276 tons went to China and 259 tons to Argentina. The Philippines took 1296 of 2194 tons of galvanized sheets.

The comparatively heavy movement of scrap to Japan gave that country first rank as the destination of shipments abroad. Canada ranked second, taking 17,640 tons.

Sharp Gain in Concrete Bar Imports

Imports of ferromanganese in May rose to 3047 tons from 2510 tons in April. The May movement included 1631 tons from Canada; 530 tons from Norway; 393 tons from Jugoslavia; 332 tons from the United Kingdom and 119 tons from Germany. Imports of concrete reinforcement bars rose from 2650 tons in April to 4508 tons in May, of which 3168 tons came from Belgium and 1340 tons from France. Of the 2076 tons of merchant steel bars imported in May, 1099 tons came from Belgium; 442 tons from Germany; 309 tons from France and 155 tons from Sweden. Tin plate imports dropped from the high April figure of 4151 tons to 392 tons, of which 389 tons came from the United Kingdom. Of the 1989 tons of hoops and bands received in May, France supplied 743 tons; Belgium, 685 tons, and Germany, 530 tons. Imports of manganese ore concentrates were 2479 tons, of which 2470 tons came from Russia, the remaining 9 tons coming from Cuba.

Belgium led as the source of May imports, supplying a total of 8230 tons. The Netherlands ranked second, furnishing 7201 tons. Then followed, in order, the United Kingdom, 6750 tons; Canada, 4035 tons, and India, 4019 tons.

Output of Steel Last Year Exceeded Preliminary Estimates

Official Statistics Show Large Drop in Both Capacity and Output of Steel Castings

PRODUCTION of steel ingots in 1931 totaled 25,428,922 gross tons, according to the statistics which have now become available from the American Iron and Steel Institute. The total output of steel castings was 516,579 tons, so that the total of both ingots and castings was 25,945,501 tons.

The output of ingots was about 1.7 per cent greater than estimated by THE IRON AGE in its issue of Jan. 7, but it appears that the companies reporting to the institute, instead of making 95.21 per cent of the total, as was the case in 1930, accounted for 94.1 per cent, and, accordingly, the institute's preliminary figures were too low. On the basis of a mean capacity for last year of 67,600,000 tons, 1931 may be put down as a year that engaged 37.6 per cent of capacity.

An accompanying table gives the statistics for two years. Output of ingots fell 35.7 per cent from the total of 1930 but electric steel showed a recession of only 23½ per cent. The drop in steel castings was 53.3 per cent. The sharpest decline was in basic open-hearth castings—61 per cent. Acid castings were off 55 per cent, and electric steel castings 42½ per cent.

Electric Steel Holds Its Position

The amount of electric process ingots made was 0.925 per cent of the total of all ingots. In 1928 electric ingots represented 0.9 per cent, in 1929, 0.97 per cent, and in 1930, 0.775 per cent; the expectation that electric ingots would shortly amount to 1 per cent of all the ingots has not yet been realized, although the figure of 1931 (0.925) shows that the electric process held close to that ratio.

A review of the statistics respecting duplex steel shows a definite trend downward. Whereas 12 to 15 years ago the amount of steel produced by the duplexing process was 11 to 12 per cent of the total, the percentage fell in the last few years to 6 per cent and in 1931 was 4.28 per cent.

PRODUCTION OF INGOTS AND CASTINGS, GROSS TONS

	1930	1931
Ingots		
Basic open-hearth	33,898,518	21,986,933
Acid open-hearth	367,181	194,388
Bessemer	5,020,588	3,011,394
Crucible	1,563	831
Electric	307,418	235,376
Total ingots	39,595,268	25,428,922
Castings		
Basic open-hearth	369,798	143,465
Acid open-hearth	413,675	184,780
Bessemer	14,871	12,052
Crucible	690	716
Electric	305,181	175,566
Total castings	1,104,215	516,579

The output of alloy steel, relatively, was off in ingots but showed a decided increase in castings. Ten years or more ago about 4 per cent of all the ingots were of alloy steels; the ratio was 6 per cent in 1928, approaching 7 per cent in 1929, and was 5.89 per cent in 1930, and 5.38 per cent in 1931. Alloy steel castings, on the other hand, represented 17.4 per cent of all castings last year, whereas for the preceding four years the average was about 12.5 per cent. Ten or 12 years ago the percentage was of the order of 5 per cent.

The total production of rolled steel last year was 18,987,168 tons, showing a general average yield from ingots of 74.5 per cent. Some comparative figures are given in an accompanying table, which includes rolled iron as well as steel. Against a general recession of 35 per cent in the total from the output of 1930, the falling off in black sheets was, by comparison, 28 per cent, that in reinforced-concrete bars, less than 25 per cent, and in hot-rolled strips, 16½ per cent. Strips made the best showing relatively last year except railroad ties, which were actually in larger production in 1931 than in 1930.

PRODUCTION OF FINISHED ROLLED IRON AND STEEL, GROSS TONS

	1930	1931
Rails	1,873,233	1,157,751
Universal plates	1,040,715	614,837
Sheared plates	2,622,108	1,351,375
Black Sheets	3,511,557	2,538,014
Black sheets on tin mills	1,892,986	1,535,355
Wire rods	2,348,600	1,844,620
Structural shapes	3,512,473	2,062,858
Merchant bars	4,138,364	2,444,395
Bars for rein. conc.	850,151	643,633
Skelp, pipe steel, etc.	2,682,046	1,499,280
Hoops	79,844	56,003
Cotton ties, etc.	46,194	57,112
Splice bars, tie plates, etc.	606,390	389,579
Hot rolled strips, etc.	1,941,862	1,620,971
Rolled sheet piling	105,603	73,670
Railroad ties	10,614	14,246
Forging blooms and billets	304,090	114,664
Billets, sheet bars, etc., export	9,485	1,960
Billets for seamless tubes	1,248,156	732,569
All other rolled products	688,536	423,002
Total*	29,513,007	19,175,894

*Of the total, 316,053 tons was iron in 1930 and 188,726 tons in 1931.

Steel Casting Capacity Reduced

The country's capacity for making steel castings has been reduced in the year by an amount that is, roughly, 42,000 tons per annum, according to figures issued by the American Iron and Steel Institute and supplementing capacity figures for pig iron and steel ingot making, presented in THE IRON AGE of June 23, page 1374. The capacities for various kinds of steel castings are as follows:

	Dec. 31, 1930	Dec. 31, 1931
Basic open-hearth	811,310	789,700
Acid open-hearth	691,290	678,190
Bessemer	37,875	30,375
Electric	540,615	540,940
Crucible	1,995	1,940
Total	2,083,085	2,041,145

OFF THE ASSEMBLY LINE

June Will Exceed May in Motor Car Output Because of Ford Expansion

▲▲▲

DETROIT, June 27.

Ford's Rouge plant will work straight through the summer without a vacation interruption.

* * *

On June 20 Plymouth turned out 2100 cars, the largest single day's production in its history.

* * *

An increasing number of steel orders for experimental purposes are being placed by automobile makers.

▼▼▼

EXCEPT for a slight flurry of getting cars into the hands of dealers prior to the twenty-first of the month when the Federal sales tax took effect, June has brought slight solace to the automobile industry. Due to Ford's expansion the month will top May from a production standpoint, but by what margin only the official figures will tell. In many factories activities have been so irregular that it would be impossible to make an accurate estimate of this month's assemblies.

The sustained performance of the Ford Motor Co. continues to be the wonder and envy of the industry. About 5000 cars a day are being manufactured five days a week and motor assemblies at the Rouge plant have increased so substantially that stocks of parts are being eaten into. Some departments are finding it necessary to work six full days a week to keep abreast of the demand for material from assembly lines. It is significant that the Ford company has such an accumulated volume of orders for its cars that it has abandoned all thought of shutting down for even a short summer vacation and will work straight through the summer without interruption. The present backlog of orders is reported sufficient to carry production along at approximately the current level for at least 60 days. Ford of Canada likewise is in an enviable position, with enough business on hand to operate at a good rate until the middle of August without the receipt of a single additional order. It is expected to ship 1500 to 1800 V-eights during July to foreign countries served by Ford of England and during the next year will supply 18,000 cars for this export trade.

Ford Makes Drive for Truck Business

Having completed a "Ford Truck Week," the Ford sales staff is in the midst of a vigorous effort to take undisputed leadership in the commercial car as well as in the passenger car field. Truck production is said to represent a considerable portion of the Ford four-cylinder jobs now being turned out. Steel releases have been holding up fairly well, especially for sheets and strip steel. Purchases of rustless steel also have been relatively good. Ford continues a poor prospect for steel bars, as its own bar-making facilities are adequate to take care of all requirements at the present operating rate. Since a stepping up of production beyond the present point is not contemplated, steel bar makers might as well resign themselves to the fact that they will get little or no business from Ford this year. Ford frame output has been somewhat lower than it was a few weeks ago, as it is understood that a surplus of frames has accumulated at branch assembly plants.

Plymouth Showing Is Encouraging

With this month's program set at 35,000 to 40,000 cars, Chevrolet's July assemblies are likely to drop to 25,000 cars or less. June 20 marked the highest day's production in Plymouth's history, when 2100 units were built; factory shipments last week were about 8000 cars. This spurt was accounted for by the desire to get cars under the sales tax wire. Plymouth is doing amazingly well in combating the Ford eight with a four at a considerably higher price. However, its manufacturing activities are expected to taper. Incidentally, Plymouth is the only car to show a continuous gain in both shipments and retail deliveries for the first five months of each year since 1928. Willys-Overland presented in the past week its "advanced 1932 line" of sixes and eights, the base price of the former being $535 compared with $460 for the Ford V-eight, $445 for the Chevrolet six and $495 for the Plymouth four. It is significant that despite all the talk about the necessity today for a car priced at or near Model T Ford, which will provide transportation rather than luxury, no maker is rushing into the field to supply such a car. Auburn is said to be meeting with good results in its campaign to sell a big car for a comparatively small amount.

It is notable that an increasing number of steel orders for experimental work are being placed by automobile makers. This may be taken as an indication that work on designing 1933 cars is well advanced. One company making a multiple line of cars is reported contemplating a sweeping revision of its models for next year and therefore may revamp its motor line. Buick has revised upward its production estimates for next month; this is not surprising in view of the fact that it has been holding output down to or below the sales level. Most medium-priced builders are counting on confining assemblies within narrow limits this summer and perhaps shutting down for several weeks. Some plants already are virtually closed.

In its stand in behalf of price stabilization the steel trade has been aided by some of the automobile builders. Realizing that steel is being sold at less than cost today, one prominent motor car company voluntarily agreed not to bring pressure to bear to obtain lower quotations, but to go along with its regular sources of supply through the third quarter at the regularly established figures. Price is, perhaps, less a bone of contention in the local steel market than it has been in months.

... PERSONALS ...

GEORGE G. THORP, who on July 1 succeeds EUGENE J. BUFFINGTON as president of the Illinois Steel Co., has been a vice-president of the company since 1906. He was born at Pittsburgh and took a course in mechanical engineering at the University of Wisconsin. When he completed the course in 1891 he decided to spend one year at the university in special research work before entering a business career.

In 1892 he accepted the position of engineer of tests at the old North Works of Illinois Steel Co. This plant later was converted into a warehouse, but in 1892 it had the only Illinois Steel Co. capacity for structural shapes. From North Works Mr. Thorp was transferred to Joliet works as assistant master mechanic, which position he left to become chief engineer for three years of the Colorado Fuel & Iron Co., Pueblo, Colo. Upon his return to the Illinois Steel Co., he was made general superintendent of the Joliet works.

His next move was to Pittsburgh, where he spent five years up to 1906, first installing and then operating the Clairton works for Carnegie Steel Co. He was then recalled to Chicago to become vice-president of Illinois Steel Co., and also vice-president of the Indiana Steel Co., which undertook the task of building the Gary works at the southern tip of Lake Michigan. From 1906 to the present time Mr. Thorp has thrown his energy into both the design and operation of this development. It is one of the largest steel-making plants in the country.

Mr. Thorp is a member of the American Iron and Steel Institute and the American Society of Mechanical Engineers, and is a director of the First National Bank of Chicago.

EUGENE J. BUFFINGTON, whose retirement as president of the Illinois Steel Co. was announced in THE IRON AGE of June 23, has had a long and outstanding career, during a period when the steel industry of this country advanced from humble beginnings to world leadership. His rise from wire nail salesman to the presidency of the Steel Corporation's great Western subsidiary was outlined a week ago. In addition to heading the Illinois Steel Co., Mr. Buffington had other wide responsibilities, including a directorship in the United States Steel Corpn. and directorships or premier executive connections with the Indiana Steel Co., the Illinois-Scully Steel Warehouse Co., the Universal Atlas Cement Co., the Gary Land Co., the H. C. Frick Coke Co., the United States Fuel Co. and the United States Coal & Coke Co.

In a valedictory statement Mr. Buffington said:

"After 48 years of service to the steel industry, 33 years of which I have been with the Illinois Steel Co. as its president, I have asked to be retired from further service.

"My association with the Illinois Steel Co. and through it with the United States Steel Corpn., represents the principal part of my business life and has been a great pleasure and satisfaction to me.

"If I had my business life to live over, I would choose the steel industry for my business career, and association with the United States Steel Corpn. The steel industry, in my opinion, offers the largest opportunity for service along most interesting lines.

"After so many years of service I naturally feel that it is time for me to retire and take life more leisurely."

GEORGE COOK KIMBALL, who has been made vice-president of the Illinois Steel Co., succeeding G. G. THORP, has been vice-president of the American Sheet & Tin Plate Co., Pittsburgh, in charge of plant construction, improvements, patents and similar matters, since Sept. 15, 1931. A native of Massachusetts, he was graduated from Harvard University in 1900, and entered the steel industry the following year in the engineering department of the American Tin Plate Co. at Pittsburgh. He continued in this capacity after the formation of the American Sheet & Tin Plate Co., and was appointed chief engineer in 1905. He later became assistant to vice-president of the company but continued as chief engineer, retaining this position until his appointment as vice-president last year. During his long association with the company Mr. Kimball has been responsible for many important engineering developments in the flat rolled steel industry, and has won wide recognition through his unusual combination of technical ability and rare personal charm. Mr. Kimball has taken great interest in educational affairs, particularly as related to his Alma Mater. He has served as president of the Harvard Club of Western Pennsylvania and the Associated Harvard Clubs, and is at present vice-president of the Harvard Alumni Association. He was one of the founders of the Arnold School, a preparatory institution in Pittsburgh, and served for a number of years as president of its board of trustees. Civic duties have long claimed his attention, and his assistance is eagerly sought in many of the constructive social and philanthropic movements in the Pittsburgh district. He is a director of the Commonwealth Trust Co., and a member of a number of clubs in Pittsburgh.

JAMES R. MILLS, for many years district manager of sales at Cleveland for the Carnegie Steel Co., the Illinois Steel Co. and the Tennessee Coal, Iron & Railroad Co., has been made manager of sales in the New York district for the Carnegie company, succeeding CHARLES C. CLUFF, who is retiring after more than half a century in the steel business. FRANCIS C. HARDIE, who has been assistant manager of sales at Chicago for the Illinois company, succeeds Mr. Mills at Cleveland.

CHARLES C. CLUFF began his career in the industry with the Iowa Barb Wire Co., Allentown, Pa., now the Allentown plant of the American Steel & Wire Co., in 1881. In 1890 he severed this connection to enter business on his own account, but five years later he became general Eastern agent for the Illinois Steel Co. When the United States Steel Corpn. was formed in 1901 he was made assistant manager of sales at New York for both the Illinois and Carnegie companies. In 1910 he was promoted to manager of sales at New York, also taking over the New York district sales for the Tennessee company.

JAMES R. MILLS has been with the Carnegie company for 34 years, having joined the Cleveland office as a salesman in 1898. He has been district sales manager in Cleveland for the past 18 years. Mr. Mills was born at Sewickley, Pa., but has resided in Ohio most of his life. He attended Allegheny College and the Ohio State University, obtaining his B.A. degree from Allegheny College. For two years before joining the Carnegie Steel Co. he was Pittsburgh representative of the *Iron Trade Review*, now *Steel*, of Cleveland. After a number of years as a salesman in Cleveland, he was appointed assistant manager of sales in St. Louis on March 1, 1905, and remained there until Jan. 1, 1907, when he was appointed manager of sales at New Orleans. On June 1, 1914, he returned to the Cleveland office as district manager of sales. During his many years' residence in Cleveland Mr. Mills has been prominent in civic activities, particularly in welfare and educational work. He was for five years a member of the Cleveland Board of Education and has been a trustee of the Welfare Federation of Cleveland, a member of the Community Fund Council of that city and a trustee of St. Luke's Hospital and the Associated Charities of Cleveland. He is also a trustee of Allegheny College. He has been a director of the Guardian Trust Co., one of Cleveland's leading banks.

FRANCIS C. HARDIE is a native of Evanston, Ill., and attended the University of Illinois and Dartmouth College, having been graduated from the latter institution in 1918. He first entered the steel industry in 1924 at the Duquesne, Pa., works of the Carnegie Steel Co., and the following

J. R. MILLS

G. C. KIMBALL

G. G. THORP

C. C. CLUFF

F. C. HARDIE

year was transferred to the company's Cincinnati office in a sales capacity. In 1926 he went to Indianapolis as resident salesman, where he remained until April, 1929. At that time he became identified with the Illinois Steel Co. at Chicago, and was promoted to the position of assistant manager of sales in that district on Jan. 1, 1931.

DAVID G. KERR, for the past 24 years vice-president of the United States Steel Corpn., with jurisdiction over the ore, coal and limestone interests of the corporation and their distribution to manufacturing plants, has requested that he be relieved of his duties on Aug. 1, 1932, retiring under the corporation's pension plan. Mr. Kerr was graduated from Lehigh University in 1884 and immediately entered the service of Carnegie Steel Co. at its Edgar Thomson works, in 1892, becoming superintendent of the blast furnaces. Later, in 1900, he was transferred to the general offices of Carnegie Steel Co. in charge of the iron ore and other raw material supplies of the company. In December, 1908, Mr. Kerr was elected vice-president of the United States Steel Corpn., succeeding James Gayley, and in which capacity Mr. Kerr has since continued. Mr. Kerr is recognized as an authority on production, transportation, supply and usability of all raw materials required in the manufacture of iron and steel. His long and eminently successful service to the industry is recognized by all his associates and friends, whose esteem and best wishes he carries with him in his retirement.

EDWIN E. ELLIS has been appointed to succeed Mr. Kerr as vice-president, effective Aug. 1, 1932. Mr. Ellis is a graduate of Northwestern University, Evanston, Ill., and took graduate work in mining geology at the University of Wisconsin, after which he served for several years on the Wisconsin Geological Survey and the United States Geological Survey. In 1906 he entered the service of the Oliver Iron Mining Co., at Duluth, Minn., as assistant geologist, and in 1908 was transferred to the Tennessee Coal, Iron & Railroad Co., as geologist. He became successively assistant manager and manager of that company's land department. In 1925 Mr. Ellis was attached to the staff of the Steel Corporation, in charge of special mineralogical research, especially in non-ferrous minerals. Mr. Ellis is also president of the Universal Exploration Co., the subsidiary of the corporation through which the research work under Mr. Ellis' direction has been conducted, and which developed the zinc ore properties of the corporation located in Tennessee. Mr. Ellis is a member of the American Institute of Mining and Metallurgical Engineers, the Mining and Metallurgical Society of America, and the Society of Economic Geologists.

❖ ❖ ❖

J. FREDERIC BYERS, chairman of the board of the A. M. Byers Co., Pittsburgh, has been elected a member of the boards of trustees of the Carnegie Institute, the Carnegie Library and the Carnegie Institute of Technology, all of Pittsburgh.

❖ ❖ ❖

C. R. PATON, who has been in charge of the experimental engineering division for the last two years, has been appointed chief engineer of the Packard Motor Car Co., Detroit. He succeeds A. MOORHOUSE, who has resigned to become an automotive consulting engineer. Mr. Paton, who is 38 years old, is a graduate in automotive and mechanical engineering of the University of Michigan, was in the Army air corps during the war and for a considerable time after the war was an experimental engineer of the national advisory committee on aeronautics to the President at Langley Field. J. R. FERGUSON, chief chassis engineer of the Packard company, has been named assistant chief engineer. He has been a member of the Packard engineering staff for 21 years.

❖ ❖ ❖

WILLIAM G. MATHER, of Cleveland, was awarded the honorary degree of doctor of laws at Trinity College, Hartford, Conn. Mr. Mather was graduated from Trinity College in 1877 and has been a trustee of the college for several years.

❖ ❖ ❖

WALTER E. MEUB, secretary-treasurer of the Youngstown Sheet & Tube Co., Youngstown, has assumed the duties of WILLIAM J. MORRIS, formerly vice-president of the Continental Supply Co., pipe distributing subsidiary of the Youngstown company, who was recently made president of the latter company, with headquarters in St. Louis.

❖ ❖ ❖

EDWARD L. RYERSON, JR., president of Joseph T. Ryerson & Son, Chicago, and a member of the Yale class of 1908, has been elected an alumni fellow of the Yale Corpn. For several years he was a member of the board of the Yale scholarship trust of Chicago.

❖ ❖ ❖

ARTHUR MALLETT, formerly chief engineer of the Thomson-Gibb Electric Welding Co., Bay City, Mich., and CLYDE COATES, heretofore designing engineer with the Taylor-Winfield Corpn., Warren, Ohio, have joined the staff of the Federal Machine & Welder Co., Warren, Ohio.

❖ ❖ ❖

EDWIN H. BROWN, mechanical engineer, A. O. Smith Corpn., Milwaukee, has returned home after an absence of nearly eight months spent in Europe in study and observation.

❖ ❖ ❖

WILLIAM W. COLEMAN, president, Bucyrus-Erie Co., South Milwaukee, Wis., has concluded a business trip of three months in Europe.

• • EDITORIAL

A Super-Board to Foster Confidence

FLATLY contradictory claims in respect to the existence of prosperity in the United States were made in the respective platforms of the two great parties in the campaign of 1928. The speeches of the defeated candidate were a heated arraignment of the party in power for bringing poverty to the farmer and for failing to give work to an army of unemployed even then great, though the crash of speculation was more than a year distant.

This year every voter knows all too well the story of nation-wide distress, however much platforms may differ as to causes and as to the party and policies that will soonest bring better times. On the one hand, while rightly denying responsibility for the depression, the administration makes the most of every indication of a turn in the tide. Its opponents naturally give political emphasis to any failure there may have been to appraise promptly the seriousness of the situation or to provide adequate relief for suffering millions.

Lately the suggestion was made to the President by thirty-six men well known in industry, finance and labor that the war-time Council of National Defense, as an alternative its advisory commission, be revived to help the country in a crisis no less than that of the World War. Mr. Hoover did not favor the proposal, holding that the Cabinet, the Government bureaus, and the specially created federal bodies now dealing with the situation are in close cooperation and that they constitute a most effective economic council.

We do not minimize in the slightest degree the vast good already done in allaying fear and in meeting the emergencies of financial and physical relief. Nevertheless we believe that a non-partisan super-board of economic planning could accomplish much more, especially in the four months in which stress is bound to be put on the political bearing of every act and utterance of the administration.

A stage has been reached in the country's hard experiences when it is reasonable to look for the first signs of betterment. At such a time the proposed board, were it, for example, to concentrate upon putting out unbiased information in respect to further Government economies, excise and other taxes, Government outlays that will go farthest in giving employment, and upon the strengthening of the people's confidence, could be of the highest public service. Unjust as were press comments in Paris and elsewhere, connecting the impending national election with President Hoover's disarmament proposal, they illustrate the extraordinary need just now of convincing counsel that will be heard above the din of parties and accepted and acted upon.

A non-partisan advisory board would recognize, as warring Congressmen have failed to do in all these months, that action promptly taken means just the difference between starting and failing to start the wheels of production. Shortening of work hours and distributing employment among more men and women, as President Green and other labor leaders keep on urging, will not add to total purchasing power, but every increase in public confidence and in the extension of credit will mean added work and added consumption.

Bernard M. Baruch, who in 1917-18 was chairman of the War Industries Board, made public at Chicago this week an arresting statement which stressed the need at this juncture of doing just what was done at Washington in the World War—giving "priority" to needs and measures which are of first importance. Such a board of strategy as we believe is now called for, made up of outstanding men in industry, finance and labor, would be of like incalculable help in putting first needs first and in building confidence and loosening credit.

• • •

Expert Investigation Before Investment

ENGINEERING opinion should be a part of any prospectus to distribute new securities. Agitation to that end should be continuous until expert certification becomes accepted practice. For years the American Institute of Consulting Engineers has been trying to persuade investment bankers to obtain reputable and thorough engineering advice on projects being financed in the United States. And Dr. Charles E. Skinner of the Westinghouse company, in an address on retiring from the presidency of the American Institute of Electrical Engineers, rightly says such a course seems particularly desirable in connection with construction work in foreign countries financed by bond issues floated in this country. In the recent boom years, he asserts, many securities were sold for projects that had been condemned as unsound by engineers of high reputation for honesty and good judgment. American financiers may well take a leaf from the book of the British, who at least obtain preliminary surveys and advice on foreign investments and then take steps to retain control of expenditures. In the last analysis it remains with the investor to demand something beyond ex parte assertions.

• • •

Low Cost Help for the Railroads

COL. AYRES, in the Cleveland Trust Company's business bulletin of June 15, sets forth that $335,000,000 face value of railroad bonds had paid more interest to their holders in a year than their market value on May 25 (less than $17,000,000), and were continuing to pay. They were in a group selling at less than 10 per 100 face. Another group, selling at 10 to 20, amounting to $920,000,000 face, had a market value of $123,000,000.

None of these bonds was in default. It is the policy of the United States Government not to let rail bonds default, the intention being to loan money to pay interest when necessary. But why not have the railroads buy some of their cheap bonds and loan them money for this purpose? This idea is being urged at Washington. In

COMMENT • •

the case of the lowest class, each dollar loaned now would wipe out one dollar a year needed in future to maintain interest payments on the bonds that would thus be retired. That is very low cost help for the railroads.

Whether railroad valuations or capitalizations are too high or too low has become a purely academic question. The practical thing in present circumstances is to reduce capitalization where it can be done so economically.

• • •

Modern Testing in Bus Maintenance

IN a recent report the Third Avenue Railway system, New York, showed a sharp increase in the net income for the ten months period ended April 30, 1932, against a decline in gross income. This is particularly significant when it is realized that a major activity of this company is an extensive passenger bus service. Bus lines generally have been slow to adopt operating methods commensurate with methods employed by railroads, and it is most encouraging to find that the Third Avenue Railway system, which has been a leader in placing its bus equipment on a sound engineering basis, has found that this policy pays. This company's bus maintenance furnishes a good example of modern testing and repair service of a high order. All parts entering into the construction of new buses are tested for flaws or cracks by a newly developed non-destructive method. By this means many parts have been rejected which otherwise would have gone into service with serious concealed flaws.

The difficulties in the way of safe bus operation are many but this should increase rather than diminish the efforts of the operating company to secure equipment of the utmost reliability. The example of the Third Avenue Railway system shows that an effort in this direction pays.

• • •

Distribution of Steel in an Off Year

ALLOWING for the general decline in tonnage, from 1929 to 1931, tin plate did nearly twice as well as merchant bars last year. Rails declined more than the average, but not as much as bars or even plates.

Total production of finished rolled iron and steel last year, 19,175,894 tons, was 65.0 per cent of 1930 and 46.7 per cent of 1929. As 1930 was merely an intermediate year, comparison between 1929 and 1931 is the more interesting, as to the distribution of the total into the respective finished products. For the table below, each item in 1929 was multiplied by .467 and the product divided into 1931, the decimal point being moved two places, resulting in the following index numbers:

1931 *Distribution Compared with* 1929	
Tin and terne plate	159
Concrete reinforcing bars	145
Hot rolled strips	139
Blanks for seamless tubes	116
Sheets	103
Structural shapes	93
Skelp	91
Rails	91
Plates	84
Merchant bars	81

Tin plate running 59 per cent greater tonnage last year than it would had it decreased from 1929 as much as did steel in general furnishes no surprise, but it seems curious that concrete reinforcing bars should do so much better than structural shapes. Strips make a very good showing, due partly to the fact that they are a rising commodity, for production nearly doubled from 1922 to 1925 and then fully doubled from 1925 to 1929. Rails did not do so badly, but the poor showing of merchant bars is rather noteworthy seeing that they are a commodity of such widespread use.

This year's distribution of such steel as is made is not likely to show great variations from last year's alinement, which reflected rather fully the difference between good times and bad times as to how the various descriptions of steel fare.

• • •

Seasonal Unemployment in Iron Mines Could Be Prevented

IRON mining schedules in the Lake Superior ranges during the current year will probably establish a new low record. It is unlikely that more than 10,000,000 tons of ore will be shipped from Lake Superior ports. In operating the iron mines this year, the steel industry is prompted almost entirely by a desire to provide financial assistance to the communities whose welfare is so closely related to mining, as stocks of iron ore at furnaces and on lower Lake docks is more than sufficient to maintain operations through another year.

While seasonal unemployment in the iron mines is due largely to the open-pit method, used to a large extent on the ranges, the establishment of underground mines which could be operated in the winter would not help the situation in Minnesota because of the existing taxes. In Michigan, underground mines could be operated in winter, and the ore stocked for shipment during the following season. This would not be possible in Minnesota, for stock-piled ore remaining on the premises on May 1 is still further burdened with an additional personal property tax. If it were not for this tax, ore might even be mined in the large open-pit operations of the Mesabi range to provide employment during the current depressed season. Because of the Minnesota tax, ore thus mined to provide relief would have to be shipped promptly. Shipment involves a cash outlay for royalty, and an average of $1.81 in transportation charges, as well as storage space at the lower Lake ports. It is obvious that the steel companies cannot operate on that basis, even to provide relief. This is only another of many instances in which unfair taxes have reacted to the detriment of the citizens of Minnesota.

Tariff Increases Have Little Effect on British Trade

Tin Plate Demand Moderately Active—Continental Works Face Shrinking Demand

LONDON, ENGLAND, June 27 (*By Cable*).—The iron and steel market is quiet, the recent tariff increases having had little effect on demand. British steel works are fairly busy on Russian orders, but otherwise export demand is negligible.

The Continental market is awaiting Lausanne decisions. Meanwhile business is dull, and some Belgian plants are arranging to curtail output rather than sell at current prices. Belgian mills bartered a quantity of light rails for Brazilian coffee.

Tin plate is steady to firm, with makers asking over 15s. per base box, f.o.b. works port, for tin plate to be made. Demand from the Continent, South America and domestic canners is moderately active. John Lysaght, Ltd., Bristol, secured a substantial order for black sheets for shipment to Russia. Dorman, Long & Co., Ltd., Middlesbrough, provisionally secured a contract valued at £2,000,000 for construction of a Danish road and rail bridge to connect Seeland and Falster. The bridge will be the largest in Europe outside of Great Britain. All the steel will be British, and work will commence about November.

British prices are unchanged.

The German Dresdner Bank has acquired a large block of Gelsenkirchen Bergwerks shares, thus obtaining a large interest in the Vereinigte Stahlwerke. German steel masters see no definite sign of trade improvement and expect conditions to grow worse as Russian orders are nearly completed and export business is negligible, while German railroads are withholding orders. Recent Russian orders booked by Poland involve 80,000 tons, including boiler plates, bars, thin sheets, dynamo and transformer sheets. Deliveries are to begin July 1.

Russia has commenced the construction of its new Leningrad steel works, designed for an annual output of 27,000 tons of ingots, 60,000 tons of large forgings and 425,000 tons of rolled steel.

Pretoria steel works construction is proceeding steadily and operations are expected to start early in 1934. It is officially estimated that even under current abnormal conditions the works could operate at a profit.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9	0s.	
Billets, open-hearth	4	17	6d to £5 7s. 6d
Black sheets, Japanese specifications	9	12	6
Tin plate, per base box	15	0	to 15 6
Steel bars, open-hearth	7	17½	to 8 7½
Beams, open-hearth	7	7½	to 7 17½
Channels, open-hearth	7	12½	to 8 2½
Angles, open-hearth	7	7½	to 7 17½
Black sheets, No. 24 gage	8	0	to 8 10
Galvanized sheets, No. 24 gage	9	5	to 9 7 6

Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £ at $4.86

Billets, Thomas	£1	19s.	
Wire rods, No. 5 B.W.G.	4	10	
Black sheets, No. 31 gage, Japanese	11	5	
Steel bars, merchant	2	3	
Beams, Thomas	2	1	6d
Angles, Thomas, 4-in. and larger	2	2	
Angles, small	2	4	
Hoops and strip steel over 6-in. base	3	5	
Wire, plain, No. 8	5	7½	
Wire, barbed, 4-pt., No. 10 B.W.G.	8	15	

Equipment Orders Better in May

The Foundry Equipment Manufacturers Association reports a slight pick-up in foundry equipment orders in May when bookings were indexed at 18, compared with 13.75 in April which was the poorest month since last November. Bookings in the first three months of this year were indexed by the association at 20.5 in January, 27.6 in February and 27.5 in March.

Rehearing on Marking of Foreign Bars Granted

WASHINGTON, June 28.—At the request of importers, the Bureau of Customs has granted another hearing, to be held July 7, in the proceeding regarding the marking of imported reinforcing bars with the country of origin. The bureau's decision held with domestic interests that the bars can be practicably marked, since American bars are so marked, and made the requirement that they must be so marked. It extended the effective date so as the order now stands it will become operative on July 14.

Whether the rehearing will modify the decision cannot be known, but indications appear to be that the bureau will stand by its decision, though there have been reports that it may be modified as to smaller sized bars. Domestic interests are strongly opposed to any change in the decision and the bureau itself has indicated the belief that they have completely justified their position.

Pure Nickel to Be Rolled on Steckel Mill

Experiments on the new Steckel hot strip mill were resumed this week at the Brier Hill plant of the Youngstown Sheet & Tube Co. Experimental rollings were witnessed several weeks ago by representatives of European steel companies, most of whom have left. Included in the material to be rolled in the current demonstrations is pure nickel, furnished by the International Nickel Co., whose representatives are studying the new mill. British stainless steel is also to be tried on the mill, and a number of British representatives are present for this exhibition. A. P. Steckel, president of the Cold Metal Process Co., which controls the patents and is building the mills, advises that representatives of the Crucible Steel Co., the Republic Steel Corpn. and many other domestic concerns will be present.

To Develop Specifications for Clean Coal

Development of specifications for clean bituminous coal will be undertaken by a technical committee under the procedure of the American Standards Association as the result of a request made by the American Institute of Mining Engineers. The project has been the subject of an extensive canvass of producing and consuming groups during the past year, and it is said that, although the project is difficult, attempts should be made to harmonize the divergent interests affected by such a standard. For the present it is proposed that the work should be confined to groups located east of the Mississippi River.

Bulletin No. 239, "Tests of Joints in Wide Plates," by Wilbur M. Wilson, James Mather, and Charles O. Harris, has been issued by the Engineering Experiment Station, University of Illinois, Urbana, Ill. It covers tests of riveted lap and butt joints; joints for which the holes were drilled and others for which they were punched; joints with rivets in single shear, and others with rivets in double shear; welded joints, both lap and butt; joints having rivets supplemented with welds; and wide plates containing no joints.

SUMMARY OF THE WEEK'S BUSINESS

Steel Production Driven to New Low by Widespread Holiday Suspensions

Ingot Output, Now at 15 Per Cent, Likely to Go Several Points Lower Before July 5; Scrap Again Declines

FURTHER shrinkage in ingot output and additional declines in steel scrap prices have given added emphasis to the negative features that have characterized the iron and steel market in recent weeks. Raw steel production has receded from a national average of 16 per cent a week ago to 15 per cent, and will fall to still lower levels before the close of the week.

Independence Day shutdowns will be longer and more general than usual. Many steel plants are scheduled to stop operations on Thursday and, though some of them will resume immediately after the holiday, others will not start up again until the middle of July, while one large independent unit will remain inactive during the entire month.

Holiday suspensions will also be the rule for numerous steel-consuming plants, although it is doubtful whether consumption has receded as sharply as production. Steel shipments of late have been running heavier than ingot output, since producers have preferred to clean up stocks of cold metal rather than start up furnaces for short runs.

While it is true that nearly all outlets for steel, including the automobile industry and public construction, seem to be closing up, the current level of demand is so exceedingly low that for that reason alone a rebound is looked for. But such a pickup will not be immediate, in the opinion of the trade, since the momentum of the depression is for the time being getting additional impetus from seasonal influences. While there will naturally be some recovery in output after the Fourth of July shutdowns, no real upturn is believed possible before September at the earliest.

SCRAP prices have proved very sensitive to the drastic curtailment of demand, now accentuated by complete plant suspensions. Scrap dealers, in many cases, are so loaded with material that they are reluctant to purchase current offerings no matter how low the price. Large scrap producers, finding that they are virtually forced to "give" material away, are likely to follow the lead of an important automobile manufacturer in holding material off the market, pending an improvement in demand.

Declines in scrap prices this week bring THE IRON AGE composite for heavy melting steel down to a new all-time low of $6.58 a gross ton. Pig iron markets are also weaker, in the East because of foreign competition and in other sections, interestingly enough, because melters are using an increasing percentage of scrap on account of its low price in comparison with blast furnace metal. At Pittsburgh, pig iron prices have been reduced 50c. a ton, and concessions are becoming commoner in Chicago, as well as some other centers. Another primary material to give ground is spiegeleisen, which has been marked down $1 a ton to $25, furnace.

The week's showing in structural steel awards was among the best of the year to date. The total of 28,700 tons was swelled by a Washington letting of 10,400 tons, which incidentally is the last of the large Federal projects in the national capital to be placed. It is plain that public works will give less support to the steel industry from now on, unless unexpected appropriations intervene, although one of the biggest Governmental tonnages, i. e. 50,000 to 60,000 tons for Hoover Dam work, is still to be awarded. The general contract for this project is expected to be let to the low bidder, Babcock & Wilcox Co., by the middle of next week. The plates required will probably be rolled at Gary, Ind.

FORD continues to be the main source of steel tonnage among the automobile makers, but a downturn in sales has caused a revision of the production schedule at the Rouge plant, with the likelihood that output in July will be held down to 85,000 motors.

Finished steel prices are holding rather steadily, although in most cases stability reflects lack of demand. Tin plate prices have been subjected to some strain recently by spot purchases of relatively small tonnages, but no revision of the ruling quotation is looked for until the fourth quarter. Weakness in fabricated steel prices has likewise cropped out in connection with attractive jobs, but is apparently less in evidence now than several weeks ago.

THE IRON AGE composite prices for finished steel and pig iron are unchanged at 2.087c. a lb. and $14.01 a ton respectively.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	June 28, 1932	June 21, 1932	May 31, 1932	June 23, 1931
Per Gross Ton:				
No. 2 fdy., Philadelphia	$14.84	$14.84	$14.84	$17.26
No. 2, Valley furnace	14.50	14.50	14.50	17.00
No. 2 Southern, Cin'ti	13.82	13.82	13.82	14.69
No. 2, Birmingham	11.00	11.00	11.00	12.00
No. 2 foundry, Chicago*	16.00	16.00	16.00	17.50
Basic, del'd eastern Pa	16.00	16.00	16.00	17.00
Basic, Valley furnace	14.00	14.00	14.00	15.50
Valley Bessemer, del'd P'gh	16.89	16.89	16.89	18.76
Malleable, Chicago*	16.00	16.00	16.00	17.50
Malleable, Valley	15.00	15.00	15.00	17.00
L. S. charcoal, Chicago	23.17	23.17	23.17	25.04
Ferromanganese, seab'd carlots	68.00	68.00	75.00	85.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	32.00	32.00	32.00	34.00
Rerolling billets, Pittsburgh	26.00	26.00	27.00	29.00
Sheet bars, Pittsburgh	26.00	26.00	26.00	29.00
Slabs, Pittsburgh	26.00	26.00	27.00	29.00
Forging billets, Pittsburgh	33.00	33.00	33.00	35.00
Wire rods, Pittsburgh	37.00	37.00	37.00	35.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.60	1.60	1.60	1.65

Finished Steel

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.60	1.60	1.60	1.65
Bars, Chicago	1.70	1.70	1.70	1.70
Bars, Cleveland	1.65	1.65	1.65	1.65
Bars, New York	1.95	1.95	1.95	1.98
Tank plates, Pittsburgh	1.60	1.60	1.60	1.65
Tank plates, Chicago	1.70	1.70	1.70	1.70
Tank plates, New York	1.898	1.898	1.898	1.93
Structural shapes, Pittsburgh	1.60	1.60	1.60	1.65
Structural shapes, Chicago	1.70	1.70	1.70	1.70
Structural shapes, New York	1.86775	1.86775	1.86775	1.90½
Cold-finished bars, Pittsburgh	1.70	1.70	1.70	2.10
Hot-rolled strips, Pittsburgh	1.45	1.40	1.40	1.55
Cold-rolled strips, Pittsburgh	2.00	2.00	2.00	2.15

Finished Steel

	June 28, 1932	June 21, 1932	May 31, 1932	June 23, 1931
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.20	2.20	2.20	2.15
Hot-rolled annealed sheets, No. 24, Chicago dist. mill	2.30	2.30	2.30	2.35
Sheets, galv., No. 24, P'gh	2.85	2.85	2.85	2.70
Sheets, galv., No. 24, Chicago dist. mill	2.95	2.95	2.95	2.85
Hot-rolled sheets, No. 10, P'gh	1.55	1.55	1.55	1.70
Hot-rolled sheets, No. 10, Chicago dist. mill	1.65	1.65	1.65	1.80
Wire nails, Pittsburgh	1.95	1.95	1.95	1.80
Wire nails, Chicago dist. mill	2.00	2.00	2.00	1.85
Plain wire, Pittsburgh	2.20	2.20	2.20	2.20
Plain wire, Chicago dist. mill	2.25	2.25	2.25	2.25
Barbed wire, galv., P'gh	2.60	2.60	2.60	2.55
Barbed wire, galv., Chicago dist. mill	2.65	2.65	2.65	2.60
Tin plate, 100 lb. box, P'gh	$4.75	$4.75	$4.75	$5.00

Old Material

Per Gross Ton:				
Heavy melting steel, P'gh	$8.25	$8.75	$9.50	$10.00
Heavy melting steel, Phila	6.25	6.25	6.25	8.50
Heavy melting steel, Ch'go	5.25	5.50	6.25	8.75
Carwheels, Chicago	5.50	5.50	6.25	10.00
Carwheels, Philadelphia	8.00	8.00	9.00	12.00
No. 1 cast, Pittsburgh	9.00	9.00	9.00	10.25
No. 1 cast, Philadelphia	8.00	8.00	8.00	11.50
No. 1 cast, Ch'go (net ton)	6.00	6.00	6.50	9.00
No. 1 RR wrot., Phila	8.50	8.50	8.50	10.00
No. 1 RR. wrot., Ch'go (net)	3.75	3.75	3.75	7.00

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$2.00	$2.00	$2.00	$2.40
Foundry coke, prompt	3.00	3.00	3.00	3.50

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	5.50	5.50	5.50	8.37½
Electrolytic copper, refinery	5.12½	5.12½	5.12½	8.00
Tin (Straits), New York	19.12½	19.50	20.50	23.95
Zinc, East St. Louis	2.75	2.80	2.87½	3.50
Zinc, New York	3.12	3.17	3.24½	3.85
Lead, St. Louis	2.90	2.90	2.90	3.97½
Lead, New York	3.00	3.00	3.00	4.15
Antimony (Asiatic), N. Y.	5.12½	5.12½	5.12½	6.25

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

▲ ▲ ▲

▲▲▲ The Iron Age Composite Prices ▲▲▲

	Finished Steel	Pig Iron	Steel Scrap
June 28, 1932	2.087c. a Lb.	$14.01 a Gross Ton	$6.58 a Gross Ton
One week ago	2.087c.	14.01	6.83
One month ago	2.087c.	14.06	7.33
One year ago	2.137c.	15.59	9.17
	Based on steel bars, beams, tank plates, wire, rails, black pipe and sheets. These products make 87 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1932	2.087c., Mar. 29	2.037c., Jan. 19	$14.81, Jan. 5	$14.01, June 7	$8.50, Jan. 12	$6.58, June 28
1931	2.142c., Jan. 13	2.052c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.362c., Jan. 7	2.121c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.412c., April 2	2.362c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.391c., Dec. 11	2.314c., Jan. 3	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.453c., Jan. 4	2.293c., Oct. 25	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22
1926	2.453c., Jan. 5	2.403c., May 18	21.54, Jan. 5	19.46, July 13	17.25, Jan. 5	14.00, June 1
1925	2.560c., Jan. 6	2.396c., Aug. 18	22.50, Jan. 13	18.96, July 7	20.83, Jan. 13	15.08, May 5

Pittsburgh Steel Industry to Curtail Sharply This Week and Next

▲▲▲

PITTSBURGH, June 28.—The past week has brought practically no change in the rate of finished steel releases in this district, and no further activity is expected until after the Fourth of July week-end. Some third quarter contracts have been taken, but consumers generally are not anxious to commit themselves in advance, even though a higher price may be demanded for material purchased after June 30. This is particularly true in the case of such products as have been established on new bases, effective in the third quarter.

Buying by the Ford Motor Co. has been the only bright spot in the market in the last few days. Pittsburgh mills have benefited by orders for wide sheets, strip steel, seamless tubing and corrosion-resisting strip. In no case have releases from this source been sufficient to affect aggregate production in the territory. Shipments to some of the other automobile makers are holding up, but others have curtailed their requirements considerably during the month.

Pittsburgh district steel ingot production is tapering off further this week, because of complete suspension in a number of plants which have been operating on a small scale. In most cases activity in such plants will stop on Thursday for the remainder of the week, but others are not scheduled to resume production until the middle of July, and one large independent unit will continue inactive during the entire month. As a result, ingot production locally will not average more than 12 per cent, while in the Valleys similar conditions will bring production to about 14 per cent. In the Wheeling district output is estimated at about 30 per cent. Finishing mill schedules are generally no higher than steel ingot production, and continued output of 50 per cent in tin mills is more than offset by lack of activity in the heavier tonnage products. Inventories of raw steel are not large, and accumulations occur only when plans are made to close down an open-hearth plant for a week or fortnight.

Finished steel prices show remarkable stability considering the lack of demand, although the latter conditions may be responsible to some extent for the former. None of the markets has been tested by continued buying for many weeks, and light orders being placed currently offer little test of the market. Quotations on some finishes of sheets lack uniformity, and tin plate prices are not strong. Hot-rolled strip seems to be very well established on the new single price base at 1.45c., Pittsburgh, with small orders taking $1 a ton premium. Scrap prices have again declined and are largely nominal, even at the present low levels.

Ford releases are insufficient to offset reduced demands for steel from other sources.

* * *

Further decided weakness in scrap has driven heavy melting grade down another 50c. a ton.

* * *

Pig iron prices are softer, partly because foundries are using a larger proportion of scrap in their mixtures.

▼▼▼

Pig Iron

Occasional carload sales of pig iron constitute the entire business of the current market, and shipments during June have averaged at least 25 per cent under May. Many foundries are using a large percentage of cast scrap because of the low price in comparison with pig iron. The local furnace is now quoting foundry, malleable and Bessemer iron at $15, a reduction of 50c. from recent levels. This price is holding on current sales. Scarcely any business has developed in the Valleys to establish a market, but competition from Lake Erie furnaces has brought about a weak structure.

Ferroalloys

Spiegeleisen prices have been reduced $2 a ton to $25, furnace. This change follows closely after a reduction in ferromanganese to $68, seaboard. Scarcely any new business in ferroalloys is being booked, and shipments against old contracts are light.

Semi-Finished Steel

Sellers of billets, slabs and sheet bars are extending present contracts at $26, Pittsburgh, into the third quarter. The higher asking price announced a few weeks ago has disappeared. Forging billets are quoted at $33, Pittsburgh, and this price has been adhered to in recent purchases. Wire rods are steady at $37, Pittsburgh or Cleveland.

Rails and Track Accessories

The carriers generally have not closed against their third quarter inquiries, and recent specifications have been extremely light. Scarcely any rails are being taken out, and the local mill continues idle.

Bars, Plates and Shapes

The usual summer lull is now affecting the structural steel and reinforcing bar awards, and the volume of new inquiry is lower. Highway bridge work is still coming out in fair volume, but most of the large Federal projects in Washington have now been closed, and aggregate tonnage before the trade is considerably lower. Railway purchases of the heavy hot-rolled products are lacking, but some third quarter requirements will be closed in the coming week. The plate business is particularly quiet, although barge builders in the district are taking a little tonnage. Railroad car shops are generally idle. Merchant and alloy steel bars continue to move to the automobile industry in better volume than to other consumers.

Prices on bars, plates and shapes are holding very well at 1.60c., Pittsburgh, and mills consider this the most favorable feature of the market. Stronger shape prices have been reflected in recent bidding on fabricated structural steel business, although occasional deviations from the market figure are encountered.

Cold-Finished Steel Bars

The end of the quarter has not driven in much cold-finished tonnage, although producers have announced their intention of cancelling old contracts which have not been fully specified on June 30. New contracts are coming in fairly well, although many of the smaller buyers are unwilling to commit themselves on the quantity differentials now being asked. The minimum price of 1.70c., Pittsburgh, applying on lots of 10,000 lb. or more, is being generally adhered to.

Tubular Goods

Pipe demand has held up fairly well this month as compared with last, but tonnage is so light that mills are

unable to run at more than 15 per cent of capacity. Shipments to the east Texas oil fields are continuing at a fair rate, and one mill has benefited from orders for seamless tubing from the automobile industry. Line pipe awards are lacking, and there is no sizable inquiry before the trade which is likely to be placed in the near future.

Wire Products

The wire business is seasonably quiet, and mill schedules average less than 15 per cent of capacity. Movement of merchant wire products in the late summer depends largely upon crops in the South and Middle West, but there are indications of a fair demand at that time. Manufacturing consumers are taking very little wire tonnage. Prices are well held, with manufacturers' wire quoted at 2.20c., Pittsburgh, and nails at $1.95 a keg.

Sheets

Specifications last week continued at recent low levels, although several mills in the district benefited from orders from the Ford Motor Co. for early July shipment. Some of the other automobile companies are still releasing steel, but one large producer of cars in the low-priced field has curtailed its requirements rather sharply. Among the other large sheet consumers users of tack plate are making the best showing. In other lines seasonal dullness is more in evidence, and little activity is expected for several weeks.

The price structure is being well maintained, except on some of the more common finishes of sheets. In these cases mill quotations vary somewhat, particularly to the larger buyers who have enjoyed concessions under the current market during the last quarter. Nevertheless the average selling price will probably be somewhat higher in the third quarter than it was in the second.

Tin Plate

While tin plate releases continue to show limited gains, production has not risen very much because of heavy shipments out of producers' stocks. This week's schedules average better than 50 per cent of capacity, but several days' suspension over the Fourth of July week-end is contemplated in most mills. Spot purchases of tin plate amount to very little, but the price structure has been subjected to some strain in recent weeks. No revision of the official price of $4.75 a base box, Pittsburgh, is expected until well into the fourth quarter.

Strip Steel

Some mills report a considerable amount of third quarter contracting at the new single base price on hot-rolled strip steel. Specifications against old contracts are not coming in very rapidly, as the change in price is not considerable in most cases and consumers show no concern about the cancellation of old contracts. Demand from the automobile industry is spotty, and Pittsburgh mills are not sharing heavily in the business of the Ford Motor Co. A local producer has taken an order from the Ford Motor Co. for 100,000 pairs of cowl lamp reflectors of corrosion-resisting strip.

The third quarter price on hot-rolled strip is now fairly well defined at 1.45c., Pittsburgh, with 1.50c. applying to small spot orders. Contract business is taking the lower figure in nearly all instances. The price on cold-rolled material is well maintained at 2c., Pittsburgh.

Coke and Coal

An advance in prices of by-product coke in the East and the application of a higher tariff are expected to bring somewhat heavier tonnage to this district in the near future. At the present, beehive production in the Connellsville region is averaging well under 2500 tons weekly. Prices are weak, but show no quotable change.

Scrap

With practically no consumer purchases, the scrap market has again developed decided weakness, and No. 1 heavy melting steel is quotable this week at $8.50. While no sales into consumption have been made at these levels, the range represents current offering prices, and dealers are able to buy distress tonnage at even less than $8. Hydraulic compressed sheets are also weaker, and dealers lack shipping points for even local material. The general market has declined in sympathy with the principal steelmaking grades, although an exception must be made in the case of cast scrap. Foundries are substituting No. 1 cast for pig iron in all possible cases, and a strong tone in this commodity is apparent. Heavy breakable cast is also well maintained in sympathy with the No. 1 grade. Consumers are not in the market for blast furnace material, and a fair price is difficult to determine.

Trend of Valley Output Still Downward

YOUNGSTOWN, June 28.—Valley steel mills are now feeling the full effects of summer inactivity in consuming industries, but the discouraging aspects of the current picture have by no means destroyed confidence in the future. Although steel demand may decline even further during July, the prospects of fall improvement are still considered good, and the present strength of finished steel prices is very favorably regarded.

Automobile business continues to offer the best outlet for flat rolled products, although shipments this month show a rather sharp decline from May. It is believed that the demands of the Ford Motor Co. will hold up for at least another month and offset, to some extent, declines in the requirements of other consumers. Among other finished steel lines tin plate and pipe continue to make the best comparative showing, even though pipe shipments are very light. The demands of the oil companies, however, are being steadily maintained and show no indication of falling off in the next two months. Tin plate specifications are sufficient to support a 50 per cent operation in Valley mills, but gains above this figure are now unlikely. Wire and nails and plates are extremely dull.

Steel ingot production fluctuates rather sharply from week to week, but is still tending downward. Production this week will not average above 15 per cent of capacity, if all producing units in the Mahoning and Shenango Valleys and in northern Ohio outside of the Cleveland district are taken into consideration. Tin plate, sheets and strip steel are being produced at a better rate than ingot output, but sheet and strip schedules on an average are only a few points higher.

Third quarter prices are standing the test of such little contract buying as has been done. Old orders for strips, sheets and cold-finished bars are expected to be taken out this week, but the threat of cancellation has not developed much additional tonnage. Consumers seem determined to maintain low inventories, even though they are forced to pay slightly more for their third quarter needs.

The raw material markets continue very weak. Pig iron prices are nominal in view of an almost complete lack of Valley transactions, and scrap prices have not been established by recent mill purchases. Under the circumstances the market on No. 1 heavy melting steel may be quoted at $8 to $8.50.

Detroit Scrap Prices Decline

DETROIT, June 28.—Local scrap prices again have given ground, with most items off 25c. to 50c. a ton. The district steel plant has held up all shipments of material until after July 4. Dealers are so loaded with scrap that they are reluctant to take a number of items at almost any price, no matter how low. It is believed that other scrap producers will have to follow the lead of Chrysler Corpn. in holding material off the market temporarily unless they are willing virtually to give it away.

Chicago Iron and Steel Market Is Drab, with Production and Demand at Low Ebb

▲▲▲

CHICAGO, June 28.—Resumption of operations at one steel mill, together with a slightly better schedule at another, brings some encouragement to a market that is otherwise drab. The shipping rate from local mills is at about 15 per cent of capacity, whereas the rate of ingot production is several points lower. Inquiries are more numerous, but sales remain slow and specifications are at a dead level. Price structures generally are holding, though consumer pressure for lower quotations is somewhat more insistent. Users are breaking through the pig iron price to the extent of 50c. a ton. Demand for track accessories is slackening and rail releases even against contracts for last year are at a standstill. New bridge work in Oklahoma, Illinois, Iowa and Wisconsin is promising, but it is widely scattered, and from the viewpoint of shop work will mean little to local fabricators.

The scrap market appears to have sunk to its lowest possible level from the viewpoint of shipments. Some borings are moving speculatively to local docks, whereas foundry demand is almost nil and steel mills are not accepting shipments of any grade.

Steel shipments are at the rate of about 15 per cent of capacity, but actual ingot output is several points lower.

* * *

Pig iron is weaker, and steel scrap has declined another 25c a ton.

* * *

Railroad buying is at a standstill. Even releases against last year's rail contracts have ceased to come in.

▼▼▼

Pig Iron

New buying is extremely spotty and sellers for the first time in many years find several days passing without entering an order. On the other hand, shipments in June will about equal those in May, which is contrary to what might have been expected earlier in the month. The situation as to sales is developing a keener sense of competition and, while Northern iron is still moving in small lots at $16 a ton, about 50c. a ton better than this can be done on a few cars or more.

Bolts, Nuts and Rivets

The recent spurt in orders has not held, though demand has not receded to the low level reached in the early part of June. Forward contracting is listless, but there is little objection to prices.

Cast Iron Pipe

Some improvement n the bond market in Ohio is offering encouragement to sellers, who find, in the Central West, almost a total absence of tonnage orders, but slightly more activity in carload business. Bethel, Ohio, has ordered 350 tons of 4- to 8-in. cast pipe, and it is reported that Clow is low on 3800 tons of 24-in. to 36-in. pipe at Milwaukee.

Structural Material

This market still depends on support from public work. Bids will be entered June 28 at Washington for 5000 tons for a post office at Minneapolis, and in Illinois there is pending 1275 tons for a bridge for the Illinois Waterway Commission at Channahon and 770 tons for a bridge to be constructed by the commission at Marseilles. Mill prices for plain material remain 1.70c. a lb., but stability of this figure is less certain under extreme pressure of competition for tonnages regardless of size.

Wire Products

Output is sustained close to 25 per cent of capacity, but demand moves slowly downward and lower schedules of production are near at hand. Forward buying, though present on a small scale, is being done very cautiously but on rather a firm price basis. Demand from automobile manufacturers is lighter, but by August improvement may come because of new models that will be offered about that time.

Cold-Rolled Strips

Demand is declining and output does not average above 12 per cent of capacity. New buying for future delivery is sluggish, but prices are well maintained.

Rails and Track Supplies

The rail market is at a standstill. Even releases against contracts placed for delivery last year are very meager. Use of track accessories is slowing up and production departments are curtailing output. New orders for track supplies are the smallest in many weeks.

Sheets

This market is quiet, with output below 10 per cent of capacity. Even medium-sized tonnages are a rarity, because most consumers hesitate to contract, and buy only the barest of immediate needs.

Plates

Of all finished steel products plates are the dullest. Each year sees smaller proportionate quantities going into structural work because of the increasing popularity of wide-flange beam sections. Railroad shop work is again slackening, and it is not possible at this time to get a railroad official even to hint at the probability of equipment purchases in the next three or four months. Tank shops are badly in need of work and only a few very small jobs are in sight.

Bars

Taking all conditions into consideration, consumption of bars is holding up measurably well. Insofar as releases to this district are concerned, it is evident that the Ford production schedule is holding but other automobile manufacturers are curtailing output, some of them preparatory to the introduction of new models. Implement manufacturers, who quite often at this time are preparing late summer and fall manufacturing schedules, offer no encouragement to a slowly dwindling market.

Scrap

Stagnation still has its grip on the Chicago scrap market. Hydraulic bundles have recently been offered at 50c. below current quotations, but sellers find no takers. Quotations for heavy melting steel are nominal and there is no movement of this grade to local mills. Brokers are paying $2 to $2.50 a ton for cast iron borings, delivered to local docks. In recent months several cargoes of this grade have moved to Lake Erie ports, but Eastern markets are now unfavorable to additional shipments. Some scrap yards in Chicago have rather large stocks on the ground, but much of this scrap is of a miscellaneous character and only small amounts of it could be shipped against orders on brokers' books.

Eastern Pennsylvania Market Shows No Signs of Upturn

Pennsylvania Railroad Program Likely to Progress Slowly; Scrap and Pig Iron Are Weaker

PHILADELPHIA, June 28.—June business in this district was even smaller than that done in May. And while the past week has seen no change in the rate of operations, it was duller than the preceding week. No marked upturn is in sight during the summer months. The price structure on rolled steel appears to be holding up well, but scrap and pig iron reflect further softness. Absence of orders makes it difficult to determine the market on pig iron, whose prices are being influenced more and more by low-priced foreign material.

Denial has been made at the general offices of the Pennsylvania Railroad that it has bought or is in the market for rails. Its electrification program still remains to be announced. While the second instalment of its $27,500,000 loan from the Reconstruction Finance Corporation will be available next Friday, it has not apparently determined the use to be made of the first instalment of $5,000,000 received June 1. It is evident it will use the money, if all of it is drawn, much more slowly than at first proposed, and it is understood that the full amount of $27,500,000, if accepted, will be spread over two or three years.

Pig Iron

The market is so listless that it is difficult to determine its exact position. Foreign iron prices are evidently developing a softer tone in the domestic price level and reports are current of declines of at least 50c. per ton. The levels maintained in the absence of actual changes in quotations or sales in this district appear to be nominal as to certain grades. One inquiry from northern New Jersey called for 150 tons of No. 2 plain and 150 tons of No. 2X. It is not known here whether the business was closed, but an average of $13.50, eastern Pennsylvania, is said to have been quoted. An inquiry for about 250 tons of low phosphorus for Ohio delivery has created interest in view of the extremely dull market for this grade and because of the uncertainty of prices. Standard low phosphorus is nominally quoted at $22 to $23, eastern Pennsylvania furnace. Reports are current that, partially due to foreign iron competition, this range may be shaded $3 or $4 per ton when for Western delivery.

Plates, Shapes and Bars

The Panther Valley Water Co., Tamaqua, Pa., has awarded a contract for its steel pipe line to the McClintic-Marshall Corpn. The project calls for 3300 tons of plates, increased from 1700 tons. Repairs to stills and tankage requirements for an oil company in the Middle West call for a fair-sized volume of plates and the work is being figured on by mills in this district. The market is generally dull, although the mild improvement in miscellaneous demand for shapes continues.

Warehouse Business

Jobbers report that demand is at a low level. Prices are unchanged.

Sheets

Mills report no change has developed in the market, which is characterized by a dearth of orders and inquiries. Only hand-to-mouth business is moving.

Imports

Imports at Philadelphia last week included 1651 tons of pig iron from British India and 18 tons of structural shapes from Belgium.

Scrap

The market continues to lag and is still softer. Couplers and knuckles and rolled steel wheels are down 50c.

Decline in Steel Demand Checked at Birmingham

BIRMINGHAM, June 28.—The sluggish condition of the pig iron market is unchanged and immediate prospects promise little. June shipments have been the lowest of the year as a result of the steadily receding melt of the foundries. Pipe plant operations have shown no improvement. National Cast Iron Pipe, one of the large producers of the district, which has been idle for the past several weeks, now hopes to resume work on a part-time basis about July 5. The McWane Cast Iron Pipe Co. is still on a schedule of two days a week, while the American Cast Iron Pipe Co. maintains a four-day schedule on alternate weeks. The Stockham Pipe & Fittings Co. is working three or four days a month in various departments. Jobbing foundry melt is even more irregular and uncertain. Daily sales of pig iron are scattered and small. The quotation of $11 for district business is being maintained. Furnace operations have been the same for several weeks, with four stacks active. Last week Republic Steel changed its furnace from basic to spiegeleisen. Of the other three producing furnaces in the district, two are on foundry and one on basic.

Steel

New steel tonnage is at least holding its own from week to week, although there is no particular activity. Current business is largely of the usual summer variety. For the second successive week, one of the manufacturers reports a slight increase in new business. The gains during these two weeks have not been large, but the downward trend was at least arrested. The little forward business being booked at this time for the third quarter is on the basis of the prices that have prevailed during the past several months. Structural steel and reinforcing bookings are mostly of small size, with an occasional large tonnage for a public project. Open-hearth operations in Alabama are still restricted to the four active units of the Tennessee company at Fairfield. Gulf States Steel did not operate its open-hearth department last week, neither will it do so during the present week. It has been nearly a month since the Gulf States Steel open-hearths were working.

Scrap

A slight increase was noted last week in shipments of contract tonnage. New business, however, is still small and infrequent.

Cincinnati Market Is Consistently Dull

CINCINNATI, June 28.—Demand for pig iron has sagged, and the sluggishness of early May has returned. The small improvement of the last two weeks was the result of sudden needs of melters, but failed to develop a new market trend. Total bookings, the past week, were about 500 tons, all of which was in carload lots or less. Inquiry is lacking, melters preferring to order spot shipments from their usual source of supply.

Except for the slight buying flurry before the effective date of new tax rates, sheet demand has been consistently quiet. Although radio demand is lacking, sheet bookings are well diversified. Production continues to keep pace with demand. New business is for current needs. Sheet quotations, while low, continue to be firm.

Movement of scrap, either on contract or for new business, is small. Prices continue nominal and dealers are cautious in their purchases.

Holiday Shutdowns Will Bring Cleveland Output to New Low

Steel Plants and Consuming Industries to Curtail Over Fourth of July—Toledo Blast Furnace Lighted

CLEVELAND, June 28.—Holiday shutdowns will reduce the ingot output of Cleveland steel plants this week to about 20 per cent of capacity, compared with 29 per cent last week, and the rate will be somewhat lower next week. The American Steel & Wire Co., which has been operating five open-hearth furnaces, will be shut down completely from June 30 to July 11. The Corrigan McKinney Steel Co. will continue the operation of three open-hearths until Thursday or Sunday, depending upon the volume of business during the remainder of the week. The furnaces probably will resume next Tuesday, but the sheet bar mill will be idle from June 30 to July 7 for repairs. The Otis Steel Co. will operate two open-hearth furnaces during the remainder of the week but may be shut down for several days, the day of resumption next week to depend upon the volume of incoming business over the week-end. Ingot production in Cleveland next week probably will not be much, if any, above 10 per cent of the local steelmaking capacity.

Many of the industrial plants in this district will be idle for at least a week and some may be closed down in whole or in part for as long as two weeks.

Business in steel and pig iron has been declining rather steadily throughout June and has reached such a low point that any change is bound to be for the better. Just when such a turn may come and what will bring it about cannot be forecast. There are no indications that any important improvement will occur during July. Steel companies which have been canvassing the district to determine when more liberal buying may be expected find that their customers are completely at a loss themselves to appraise the situation with respect to prospects for the immediate future.

Pig Iron

There is virtually no local demand for pig iron. Sales of about 2000 tons the past week by Cleveland furnaces were mostly for out-of-town delivery. For some sellers June has been the poorest month of the year, but the business of a leading producer has been running at a fairly even level for the past two or three months. Pig iron prices are weak, and are not being tested locally because sales are mainly single carload lots, on which $15.50, base, furnace, is quoted for foundry and malleable. On sizable inquiries, a $15 quotation would undoubtedly be available. For out-of-town shipments, quotations vary from $14 to $14.50, Cleveland, according to the point of delivery and the competition to be met. Pickands, Mather & Co., blew in a furnace at Toledo yesterday, the first operation at that plant since last fall.

Bars, Plates and Shapes

There is a fairly steady demand for small lots of structural shapes for buildings, but projects in excess of 100 tons are very scarce in this district. The only important letting is 465 tons for a plant for the Val Decker Packing Co., Piqua, Ohio, which went to the Fort Pitt Bridge Works Co. Demand for bars and plates is very light. All of the steel companies have now announced third quarter prices on these products without change from those in effect during the second quarter, namely, 1.60c., Pittsburgh, for plates and shapes and 1.65c., Cleveland, for bars.

Strip Steel

The new single base price on hot-rolled strip will take effect on all orders placed after July 1. Most of the mills are quoting 1.45c., Pittsburgh, even for lots of ordinary size, but a few mills are asking 1.50c. for small lots. Cold-rolled strip is unchanged at 2c., Cleveland. Demand is very small.

Scrap

The scrap market is stagnant. There are scarcely any plants to which scrap can be shipped. Under the circumstances, prices are nominal, but the tendency is downward wherever there can be said to be even the semblance of a market.

Government Construction Pushed on Coast

SAN FRANCISCO, CAL., June 27.—By specifying that all work must be started by June 30 the Federal government is rapidly pushing forward construction of the $5,000,000 bombing base at Marin Meadows, Cal. Bids for $865,406.18 on construction work at Hamilton Field were called on June 20, and on the following day general contracts for eight different projects were awarded. Construction includes barracks and various other buildings, requiring 600 tons of reinforcing bars and 950 tons of structural steel, and also water and sewer systems requiring 600 tons of cast iron pipe.

The Pacific Tank & Pipe Co. has been awarded a contract for 150 tons of steel strips for a wood pipe line for the Associated Oil Co., Avon, Contra Costa County, Cal.

Imports

Imports of iron and steel products at Pacific Coast ports increased 2800 tons in April over the previous month, according to customs summaries issued by Government offices. The total for April was 10,842 tons, and for March, 8084 tons. The largest single item was 6900 tons of British tin plate for the two months, with almost two-thirds of the shipment in April. Excepting this item, an average import tonnage of 6000 tons would have resulted, comparing with an average of 8000 tons a month for 1931.

The tabulation shows that merchant bars are the principal imported commodity, with pig iron, reinforcing bars, fencing, nails, sheets, barbed wire and welded pipe of next importance in the order named.

Following is tabulation of imports for the two months to Pacific Coast ports, in tons:

	March	April
Tin plate	2,403	4,498
Merchant bars	1,566	1,207
Pig iron	799	342
Reinforcing bars	429	696
Fencing	392	862
Nails	570	479
Sheets and skelp	367	559
Barb wire	580	288
Welded pipe	325	492
Iron ore	...	598
Structural shapes	255	297
Hoops and bands	91	287
Pipe	106	67
Wire rods	87	...
Rails	76	78
Round wire and wire rope	38	95
Total	8,084	10,842

Foreign Firms Formed to Deal in Metals

Metaal-Handelmaatschappij N. V., Amsterdam, Holland, has been organized as a dealer in metals, ores, scrap metals, ferroalloys, etc. Montanhandel G.m.b.H., Frankfort-on-Main, Germany, which is owned by Metaal-Handelmaatschappij, has been formed to deal in similar products for its own account and as representative of the Amsterdam company. Hugo Kaufman, Amsterdam, and Leo Wreschner, Frankfort, are directors of the former concern, and Joseph Offenbacher and Siegfried O. Wreschner, both of Frankfort, are managing directors of the latter company.

New England Exports Steel Scrap to Japan

BOSTON, June 28.—Pig iron sales the past week approximated 700 tons, the largest business reported in some time. Most transactions involved Buffalo and Indian irons, with Buffalo No. 2X generally bringing $14 to $14.50 a ton, furnace, and occasionally $15. Indian iron prices are being maintained. Offers of Dutch No. 2X iron at $15 a ton, delivered Providence, R. I., found no takers. Numerous small foundries melting occasionally are using 90 per cent or all textile machinery cast, for which $7 a ton, delivered, is paid.

During the week, 2100 tons of No. 1 heavy melting steel scrap left here for Japan, the first export business noted in many months. Two firms participated in the shipment. They paid about $4.50 a ton, delivered on dock, for the material. Negotiations are in progress for another shipment of about 2000 tons in July. The Boston & Worcester Street Railway Co. this week probably will sell a round tonnage of rails for rerolling. Otherwise activity in the old material market is confined to an occasional car of No. 1 heavy melting steel for the American Steel & Wire Co., Worcester, Mass., at $5.25 a ton, delivered, which figures back to $3.50 a ton on cars, Boston, and bundled skeleton at $3.75 a ton, delivered, or $2 a ton on cars, Boston.

The New England Coal & Coke Co. has advanced domestic coke 35c. a ton, effective July 1.

Steel Output Increases at Buffalo

BUFFALO, June 28.—Pig iron business is lethargic, with nothing but small lots being ordered. Three hundred tons inquired for by a New England melter last week is understood to have been placed with an eastern Pennsylvania furnace.

Steel

A Buffalo fabricator of structural steel has taken contracts for four different jobs totaling 550 tons. Another Buffalo fabricator took a 400-ton bridge for the State of New York, near Auburn, N. Y. The Lackawanna plant of the Bethlehem Steel Corpn. continues to operate five open-hearths, and Republic Steel Corpn. is again operating three open-hearths. The Wickwire-Spencer Steel Co. will start one open-hearth about July 1 according to report. The Seneca Iron & Steel Co. has reduced operations to about 20 per cent. There will be approximately 300 tons of reinforcing bars in the 106th Armory at Buffalo.

Scrap

One of the larger Buffalo consumers is understood to have purchased a tonnage of No. 1 heavy melting steel at $6.25 a net ton, or $7 gross ton, delivered. This may be part of a reciprocal arrangement between the consumer and the railroad which sold the scrap. Beyond this, the market is inactive. There is a shortage of heavy breakable cast.

Large Hoover Dam Award to Be Made Next Week

WASHINGTON, June 28.—Award is expected to be made the middle of next week to the Babcock & Wilcox Co. by the Bureau of Reclamation for outlet welded pipe for the Hoover Dam, Boulder City, Nev., calling for 50,000 to 60,000 tons of plates. This company was the lowest bidder on the contract at a figure of $10,908,000. This includes the cost of building a fabricating plant at Bechtel, Nev., one mile from the dam, supplying of all materials, and transportation of pipe sections from tunnel entrances to their final position.

It is understood that the plates will be rolled by the Illinois Steel Co., Gary, Ind. The pipe will range in size from 30 to 25 ft. in diameter and the thickness of the plate will run as high as 2 13-16 in. Pipe sections will weigh as high as a maximum of 150 tons per unit.

The plate steel will be shipped from Gary and the fabricated sections from Barberton, Ohio, the freight to be borne by the Government on land grant bills of lading, at a cost of about $1,000,000. The work is to be completed in five and one-half years.

The Consolidated Steel Corpn., Los Angeles, has been awarded contracts by the bureau to supply bulkhead gates, structural steel gate frames, stoney gates and structural steel guides for the dam. These contracts involve about 3000 tons of steel. Awards also have been made to the Hardie Tynes Mfg. Co., Birmingham, Ala., for two bulkhead gate hoists, and to the Reading Iron Co. for two stoney gate hoists.

Late Detroit Briefs

DETROIT, June 28.—Reflecting gains this month in Ford production the employment index of the Detroit Board of Commerce stood at 70.8 on June 15, the highest point of the year.

Hudson-Essex distributers are meeting here this week to see the small gadgetless car, said to be called the Jackson, which the company will put on the market soon.

In the first 20 days of June Plymouth shipped 14,000 cars. The Saginaw foundry of Chevrolet is closed all this week and will not reopen until after the Fourth of July. It is reported that Chevrolet manufacturing plants, including the local gear and axle and forge factories, will be closed for two weeks, while Chrysler divisions are scheduling a shorter holiday shutdown.

The Ford Motor Co. is believed to have come close to attaining its goal for June, which was 112,000 cars, and assemblies next month are expected to be in about the same volume as at present. However, motor production at Rouge is likely to decline somewhat in the next 30 days. Chrysler is now placing its third quarter steel contracts.

Steel Checks "Written" and Indorsed by Welding

LT. HENRY A. SCHADE, construction corps, United States Navy, Washington, indorsing the steel check amounting to $7,500 which he and Lt. Com. Homer N. Wallin received as joint winners of the first prize of the second Lincoln arc welding competition, as announced in THE IRON AGE of June 16.

The arc welding process by which the check was "written" at the plant of the Lincoln Electric Co., was used by both winners to indorse it. With the signatures thus affixed, this 40-lb. steel check was cashed through the Union Trust Co., Washington, and then forwarded by express to the Cleveland Trust Co., on which it was drawn, to be canceled, it is stated, by machine gun bullets.

Activity in Structural Steel Is Feature of New York Market

End of Building Strike Will Release Some Steel Business—Pig Iron Market Is Lethargic

NEW YORK, June 28.—Large structural lettings feature an otherwise quiet steel market. The award of 10,400 tons for the Department of Justice Building, Washington, to the McClintic-Marshall Corp., cleans up most of the pending Governmental work at the national capital, while the placing of 9000 tons this week by James Stewart & Co. for local New York Central viaduct construction disposes of the largest pending project in the metropolitan district. The building trades strike, which has held up local construction work for some time, has apparently been settled, although a fresh outbreak of the dispute is a possibility. The strike not only checked the flow of steel to contractors, jobbers, makers of heating and ventilating equipment and others, but in some cases prevented the payment of past bills for material.

Railroad buying of rolling stock is not regarded as likely so long as traffic is so light, although large needs in locomotives are said to be accumulating, with the possibility that at least moderate purchases will be forced by the beginning of next year. One large ship repair yard has recently increased its activities, but otherwise the demand for ship steel is declining.

Announcement by the mills that they would cancel all tonnage unspecified on expiring second quarter contracts brought in some late releases but not enough to materially swell producers' backlogs.

Pig Iron

Current transactions are restricted to inconsequential lots. With vacation shutdowns to be generally in force among district foundries during July, there is little likelihood that demand will swell until August. The absence of significant buying is reflected in total bookings in the past week of barely 1000 tons, compared with a like amount the preceding week and 1500 tons two weeks ago. Prices are unchanged.

Reinforcing Bars

Fresh inquiry for bars in the past week involved 290 tons for a bridge over Shark River, route 4, Belmar-Avon, N. J., and 220 tons for a post office at Bridgeport, Conn. Recent awards included 200 tons for a loft building in Brooklyn; 300 tons for road construction, route 42, section 8, New Jersey; 472 tons for a bridge over Shrewsbury River, route 36, New Jersey, and 337 tons for a State highway bridge at Ocean City, N. J. Mill prices of 1.60c., Pittsburgh, and 1.95c., New York, are being fairly well maintained.

Scrap

With barge movement of No. 1 heavy melting steel at a standstill, the buying price for this grade is now $3 a ton. Lack of demand from foundries has forced cast scrap to nominally lower levels.

Canadian Iron and Steel Output Down in May

TORONTO, ONT.—Production of iron and steel in Canada declined sharply in May. Output of pig iron was 13,339 gross tons, compared with 16,898 tons in April. The principal loss was in basic iron, which fell from 9471 tons in April to 7068 tons in May, while malleable dropped from 7427 tons to 5130 tons. No foundry iron was produced in April, while 1141 tons was reported for May. There was no change in the number of active furnaces. Two stacks were blowing, one located at Hamilton and the other at Sault Ste. Marie, Ont.

Production of ferroalloys in May amounted to 1132 tons, a decline of 48 per cent from the 2185 tons reported for April. For the year to date output is reported at 7866 tons against 20,144 tons for the corresponding five months of 1931.

Output of steel ingots and direct steel castings totalled 29,239 tons in May against 36,030 tons in April, a decline of 19 per cent. It was 61 per cent below production in May, 1931, which was 75,235 tons.

For the five months ended with May, production of steel ingots and castings amounted to 162,370 tons, which compares with 406,272 tons for the corresponding period of 1931 and 541,292 tons in the first five months of 1930.

Pig Iron Releases Pick Up at St. Louis

ST. LOUIS, June 28.—A slight pick-up in specifications against contracts for pig iron is reported by the local maker. However, spot business continues exceedingly light, consisting of only a few carloads. The melt in the district is off considerably. Malleable plants here have not profited greatly from the automobile casting trade. Jobbing foundries are working from one to three days a week on a very much reduced schedule, and open-hearth operations are at about 12 per cent of capacity. Prices of pig iron are unchanged.

An advance of $2 a ton on wide-flange structural shapes for delivery to Texas points will be put into effect with the next quarter. Inquiries for plates from the oil fields have been brisk, but no orders of consequence have developed. Demand for wire fencing, roofing and other items used in rural sections showed no improvement during the last month.

Neither mills nor dealers are showing any interest in the scrap market, which continues extremely weak. Miscellaneous standard-section rails and steel car axles are off 50c. and 75c. a ton, respectively, the reductions being based on recent sales by railroads to dealers. Railroad lists: Mobile & Ohio, 700 tons; New York, Chicago & St. Louis, 14 carloads.

Canadian Plant to Resume Under Receivership

TORONTO, ONT., June 28.—The Algoma Steel Corpn., recently placed in receivership, has been granted authority to resume operations under the direction of former officials, and it is stated that the merchant mills and some other departments will be started up immediately. The general trend of business in the iron and steel industry of Canada is dull and listless. New orders are appearing, but the bulk are for immediate needs. Some plants, however, are maintaining a good average rate of operations due to backlogs in connection with automobile production. It is expected, however, that special attention will be given to iron and steel at the forthcoming Imperial Economic Conference to be held at Ottawa, in connection with which some of the leading British steel companies have representatives in Canada now. The Dominion Steel & Coal Co. has increased operations due to recent rail orders, while the Steel Co. of Canada, Ltd., Hamilton, is operating in a limited way in most departments.

Pig Iron

Pig iron sales are holding around 500 tons per week with prospects that further reductions may develop in the early future. In addition to the general business depression, the summer holiday season is beginning to take toll and business is showing further slowing down. Pig iron prices are firm but unchanged. Only small tonnages are being imported.

Scrap

Trading in scrap borders on stagnation. New business is highly specialized, with only a few odd lines receiving attention. Steel scrap is at a standstill.

Economic Uncertainties Hold Up Purchases of Non-Ferrous Metals; Tin Declines

NEW YORK, June 28.—With future business still obscured by political, industrial and financial uncertainties, the copper market continues virtually in a state of apathy. Domestic consumers are apparently reluctant to cover beyond their imminent requirements, with the result that current volume of sales is extremely light. Export demand in the past week reflected no particular change in foreign interest. Export bookings for June are expected to approximate the total for May, when 8400 tons was sold. Despite the absence of constructive influences, prices show unusual resistance to downward revision. Although one or two insignificant lots of electrolytic metal were offered for spot delivery last week at 5.25c., delivered Connecticut, the leading sellers are exerting little pressure to move copper even at 5⅜c., delivered, for shipment through September. The special export price is unchanged at 5.50c., c.i.f. usual foreign ports, and the official quotation is still nominally 6.25c. Lake copper is quiet and nominally quotable at 5.50c., delivered.

The Cananea Consolidated Copper Co., Sonora, Mexico, the leading Mexican copper producer, is reported to have solicited approval of the Board of Arbitrations to suspend operations indefinitely in an effort to adjust its present financial difficulties. The company cited the fact that its difficulties had been further intensified by the copper tariff, which had cut off its most important market. Further specific reactions of the new tariff have not yet developed fully. The outstanding development in prospect concerns the prospective set-up of the copper export organization. The outcome of conferences being held to determine the future of that association is expected to be forthcoming in the near future.

Tin

Tin buying in the New York market in the past week involved chiefly small lots for spot delivery, with one or two lots for August shipment. The dullness that characterizes the New York market also prevails on the London Metal Exchange, where sales of tin are reflecting a contracted consumer demand. London buyers are apparently marking time, awaiting operation of the Byrne curtailment plan which becomes effective July 1. The New York price of tin showed a gradual decline throughout the week, with today's quotation 19.12½c. a lb. The London market today was £110 15s. a ton for spot standard, £113 for future standard and £115 5s. for spot Straits. The market in Singapore today was £119. United Kingdom warehouse stocks of tin increased 296 tons last week and now stand at 33,425 tons

Lead

Demand for lead continues to be for moderate quantities. Current buying is mostly for July delivery, while interest in August shipment has already appeared in scattered quarters. With stocks of refined lead still in substantial proportions, there is little eagerness to buy far ahead. Prices are steady at 2.90c., St. Louis, and 3c., New York.

Zinc

The market for Prime Western zinc is extremely quiet. Total sales of only 700 tons last week represented one of the smallest weekly bookings since January. The price of zinc fell off slightly on June 23 to 2.75c., East St. Louis, and 3.12c., New York, and the market is apparently well established at these levels.

▲ ▲ ▲

The Week's Prices. Cents Per Pound for Early Delivery

	June 22	June 23	June 24	June 25	June 27	June 28
Lake copper, New York	5.50	5.50	5.50	5.50	5.50	5.50
Electrolytic copper, N. Y.*	5.12½	5.12½	5.12½	5.12½	5.12½	5.12½
Straits tin, spot, N. Y.	19.65	19.55	19.25	....	19.15	19.12½
Zinc, East St. Louis	2.80	2.75	2.75	2.75	2.75	2.75
Zinc, New York	3.17	3.12	3.12	3.12	3.12	3.12
Lead, St. Louis	2.90	2.90	2.90	2.90	2.90	2.90
Lead, New York	3.00	3.00	3.00	3.00	3.00	3.00

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.
Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel, electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 5.12½c. a lb., New York.
Brass ingots, 85-5-5-5, 6.00c. a lb., New York and Philadelphia.

From New York, Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	21.50c. to 22.50c.
Tin, bar	23.50c. to 25.50c.
Copper, Lake	7.50c. to 8.50c.
Copper, electrolytic	7.25c. to 8.25c.
Copper, casting	7.00c. to 8.00c.
*Copper sheets, hot-rolled	14.87½c.
*High brass sheets	12.00c.
*Seamless brass tubes	15.25c.
*Seamless copper tubes	14.37½c.
*Brass rods	9.75c.
Zinc, slabs	4.25c. to 4.75c.
Zinc sheets (No. 9), casks	9.25c. to 9.50c.
Lead, American pig	4.00c. to 4.50c.
Lead, bar	5.75c. to 6.75c.
Lead sheets	7.50c.
Antimony, Asiatic	8.00c. to 9.00c.
Alum., virgin, 99 per cent plus	23.30c.
Alum. No. 1 for remelting, 98 to 99 per cent	16.00c. to 17.00c.
Solder, ½ and ½	14.75c. to 15.75c.
Babbitt metal, commercial grade	18.00c. to 28.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

Metals from Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	23.25c.
Tin, bar	25.25c.
Copper, Lake	6.50c.
Copper, electrolytic	6.50c.
Copper, casting	6.25c.
Zinc, slab	4.25c. to 4.50c.
Lead, American pig	3.75c. to 4.00c.
Lead, bar	7.25c.
Antimony, Asiatic	9.00c.
Babbitt metal, medium grade	14.50c.
Babbitt metal, high grade	27.25c.
Solder, ½ and ½	15.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	4.00c.	4.50c.
Copper, hvy. and wire	3.75c.	4.375c.
Copper, light and bottoms	2.875c.	3.50c.
Brass, heavy	1.75c.	2.25c.
Brass, light	1.25c.	1.75c.
Hvy. machine composition	2.75c.	3.25c.
No. 1 yel. brass turnings	2.00c.	2.50c.
No. 1 red brass or compos. turnings	2.50c.	3.00c.
Lead, heavy	2.00c.	2.50c.
Zinc	1.00c.	1.375c.
Cast aluminum	2.50c.	4.00c.
Sheet aluminum	6.50c.	8.00c.

Babcock & Wilcox to Close Bayonne Plant

The Babcock and Wilcox Co., New York, announces that it will close its Bayonne, N. J., plant and transfer manufacturing operations to its Barberton, Ohio, plant. Part of the storage and service facilities of the Bayonne works will be taken care of at the company's New York warehouse. The Bayonne plant, which has been operating on part-time schedule, is well equipped for the manufacture and repair of welded and riveted boilers and boiler parts. No plans for disposal of the plant or for its operation after the first of the month have been announced.

Passing upon a complaint of the Sonken-Galambama Corpn., the Interstate Commerce Commission in a recent decision held that rates on scrap iron and steel in carloads to Kansas City, Mo.-Kan., from points in the Southwest and in Missouri are not unreasonable.

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

		Base per Lb.
F.o.b.	Pittsburgh mill	1.60c.
F.o.b.	Chicago	1.70c.
Del'd	Philadelphia	1.91c.
Del'd	New York	1.95c.
Del'd	Detroit	1.80c.
F.o.b.	Cleveland	1.65c.
F.o.b.	Lackawanna	1.70c.
F.o.b.	Birmingham	1.75c.
C.i.f.	Pacific ports	2.10c.

Billet Steel Reinforcing
(as quoted by distributers)

F.o.b.	P'gh mills, 40, 50, 60-ft.	1.60c.
F.o.b.	Birmingham, mill lengths	1.75c.
F.o.b.	Cleveland	1.60c. to 1.75c.

Rail Steel

F.o.b.	mills, east of Chicago dist	1.20c. to 1.25c.
F.o.b.	Chicago Heights mills	1.50c.

Iron

Common iron, f.o.b. Chicago		1.65c.
Refined iron, f.o.b. P'gh mills		2.75c.
Common iron, del'd Philadelphia		2.11c.
Common iron, del'd New York		2.15c.

Tank Plates

		Base per Lb.
F.o.b.	Pittsburgh mill	1.60c.
F.o.b.	Chicago	1.70c.
F.o.b.	Birmingham	1.75c.
Del'd	Cleveland	1.8035c.
Del'd	Philadelphia	1.7935c.
F.o.b.	Coatesville	1.70c.
F.o.b.	Sparrows Point	1.70c.
F.o.b.	Lackawanna	1.70c.
Del'd	New York	1.898c.
C.i.f.	Pacific ports	2.00c.

Structural Shapes

		Base per Lb.
F.o.b.	Pittsburgh mill	1.60c.
F.o.b.	Chicago	1.70c.
F.o.b.	Birmingham	1.75c.
F.o.b.	Lackawanna	1.70c.
F.o.b.	Bethlehem	1.70c.
Del'd	Cleveland	1.8035c.
Del'd	Philadelphia	1.7495c.
Del'd	New York	1.86775c.
C.i.f.	Pacific ports (standard)	2.10c.
C.i.f.	Pacific ports (wide flange)	2.20c.

Steel Sheet Piling

		Base per Lb.
F.o.b.	Pittsburgh	1.90c.
F.o.b.	Chicago mill	2.05c.
F.o.b.	Buffalo	2.00c.

Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quantity Bar Base, 2.65c. per Lb.

S.A.E. Series Numbers		Alloy Differential per 100 Lb.
2000	(½% Nickel)	$0.25
2100	(1½% Nickel)	0.55
2300	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.16 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.50 to 2.00 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bar	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Rounds and Squares	0.50
Chromium Nickel Vanadium		1.50
Carbon Vanadium		0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets unde 4 x 4 in. carry the steel bar base. Slabs with a section area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Cold Finished Bars*

		Base per Lb.
Bars, f.o.b. Pittsburgh mill		1.70c.
Bars, f.o.b. Chicago		1.70c.
Bars, Cleveland		1.70c.
Bars, Buffalo		1.70c.
Shafting, ground, f.o.b. mill		†2.05c to 3.00c.

*In quantities of 10,000 lb. or more.
†According to size.

SHEETS, STRIP, TIN PLATE, TERNE PLATE

Sheets

Hot-rolled

		Base per Lb.
No. 10	f.o.b. Pittsburgh	1.55c.
No. 10	f.o.b. Chicago mill	1.65c.
No. 10	del'd Philadelphia	1.86c.
No. 10	f.o.b. Birmingham	1.70c.
No. 10,	c.i.f. Pacific Coast ports	2.17½c.

Hot-rolled and Annealed

No. 10,	Pittsburgh	1.70c.
No. 10,	Chicago mills	1.80c.
No. 10,	Birmingham	1.85c.
No. 10,	Pacific Coast ports	2.32½c.

Hot-Rolled Annealed

No. 24,	f.o.b. Pittsburgh	2.20c.
No. 24,	f.o.b. Chicago mills	2.30c.
No. 24,	del'd Philadelphia	2.46c. to 2.51c.
No. 24,	f.o.b. Birmingham	2.35c.
No. 24,	c.i.f. Pacific Coast ports	2.85c.

Heavy Cold-Rolled

No. 10	gage, f.o.b. Pittsburgh	2.25c.
No. 10	gage, f.o.b. Chicago mills	2.35c.
No. 10	gage, del'd Philadelphia	2.46c.

Light Cold-Rolled

No. 20	gage, f.o.b. Pittsburgh	2.75c.
No. 20	gage, f.o.b. Chicago mills	2.85c.
No. 20	gage, del'd Philadelphia	3.06c.

Automobile Body Sheets

No. 20,	f.o.b. Pittsburgh	2.85c. to 2.90c.

Steel Furniture Sheets

No. 10,	f.o.b. Pittsburgh	2.65c.
No. 20,	f.o.b. Pittsburgh	3.15c.

(Prices on furniture stock include stretcher leveling but not resquaring.)

Galvanized Sheets

No. 24,	f.o.b. Pittsburgh	2.85c.
No. 24,	f.o.b. Chicago mills	2.95c.
No. 24,	del'd Philadelphia	3.16c.
No. 24,	f.o.b. Birmingham	3.00c.
No. 24,	c.i.f. Pacific Coast ports	3.50c.

Long Ternes

No. 24,	unassorted, 8-lb. coating, f.o.b. P'gh	2.80c. to 3.00c.

Vitreous Enameling Stock

No. 10,	f.o.b. Pittsburgh	2.60c.
No. 20,	f.o.b. Pittsburgh	3.10c.

Tin Mill Black Plate

No. 28	f.o.b. Pittsburgh	2.40c.
No. 28	Chicago mill	2.50c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mill	$4.75
Standard cokes, f.o.b. Gary	4.85

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$9.50
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.10
30-lb. coating I.C.	14.90
40-lb. coating I.C.	16.70

Hot-rolled Hoops, Bands and Strips

	Base per Lb.
All widths up to 24 in., Pittsburgh	1.45c. to 1.50c.
All widths up to 24 in., Chicago	1.55c. to 1.60c.
Cooperage stock, P'gh	1.60c. to 1.70c.
Cooperage stock, Chicago	1.70c. to 1.80c.

Cold-Rolled Strips

F.o.b. Pittsburgh	2.00c.
F.o.b. Cleveland	2.00c.
Del'd Chicago	2.36c.
F.o.b. Worcester	2.20c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	2.90c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)

(After Dec. 31, extras of 10c. a 100 lb. on mixed and joint carloads, 25c on pool carloads and 40c. on less than carloads will be applied on all merchant wire products.)

To Manufacturing Trade

Bright wire	2.20c.
Spring wire	3.20c.

To Jobbing Trade

	Base per Keg
Standard wire nails	$1.95
Smooth coated nails	1.95
Galvanized nails	3.95

	Base per Lb.
Smooth annealed wire	2.35c.
Smooth galvanized wire	2.80c.
Polished staples	2.50c.
Galvanized staples	2.75c.
Barbed wire, galvanized	2.60c.
Woven wire fence No. 9 gage, per net ton	$55.00
Woven wire fence, No. 12½ gage and lighter, per net ton	60.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

STEEL PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	47	21½	⅛ and ¼	+9	+34
¼ to ⅜	53	27½	⅜	25	7
½	58	44½	½	30	13
¾	62	50½	¾	33	17
1 to 3	64	52½	1 and 1¼	37	20
			1½ and 2	37	20

Lap Weld

2	57	45½	2	25	11
2½ to 6	61	49½	2½ to 3½	30	15
7 and 8	58	45½	4 to 6	32	19
9 and 10	56	43½	7 and 8	31	18
11 and 12	55	42½	9 to 12	28	13

Butt Weld, extra strong, plain ends

⅛	43	26½	¼ and ⅜	+11	+46
¼ to ⅜	49	32½	½	25	9
½	55	44½	¾	30	14
¾	60	49½	1 to 2	36	20
1 to 1½	62	51½			
2 to 3	63	52½			

Lap Weld, extra strong, plain ends

2	55	44½	2	31	15
2½ to 4	59	48½	2½ to 4	36	22
4½ to 6	58	47½	4½ to 6	35	21
7 to 8	54	41½	7 and 8	33	19
9 and 10	47	34½	9 to 12	23	10
11 and 12	46	33½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discounts of 5 and 2½% and on galvanized by 1½ points with supplementary discounts of 5 and 2½%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	38	1½ in.	1
2½ in.—2¾ in.	46	1¾ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—3½ in.	54	2½ in.—2¾ in.	16
4 in.	57	3 in.	17
4½ in. to 6 in.	46	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold-Drawn

1 in.	61	3 in	46
1¼ to 1½ in.	53	3¼ to 3½ in.	48
1¾ in.	37	4 in.	51
2 to 2¼ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		

Hot Rolled

2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. in lighter than standard gages takes the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 40% base	50

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

RAILS AND TRACK SUPPLIES

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	32.00
Light (from rail steel, f.o.b. mill)	$28.00 to 30.00

Track Equipment

	Base per 100 Lb.
Spikes, 9/16-in. and larger	$2.60
Spikes, ½-in. and larger	2.60
Spikes, boat and barge	2.80
Tie plate, steel	1.85
Angle bars	2.75
Track bolts, to steam railroads	3.50
Track bolts, to jobbers, all sizes, per 100 count	73 per cent off list

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	75
†Carriage bolts	75
Lag bolts	75
Plow bolts, Nos. 1, 2, 3 and 7 heads	75
Hot-pressed nuts, blank or tapped, square	75
Hot-pressed nuts, blank or tapped, hexagons	75
C.p.c. and t. square or hex. nuts, blank or tapped	75
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled thread up to and including ⅜ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	75
Semi-finished hexagon castellated nuts, S.A.E.	75
Stove bolts in packages, P'gh, 77½, 25 and 10	
Stove bolts in packages, Ch'go, 77½, 25 and 10	
Stove bolts in pkgs., Cleveland, 77½, 25 and 10	
Stove bolts in bulk, P'gh	86
Stove bolts in bulk, Chicago	86
Stove bolts in bulk, Cleveland	86
Tire bolts	60 and 10

Discount of 75 per cent off on bolts and nuts applies on carload business with jobbers and large consumers.

Large Rivets

(½-in. and larger)

	Base per Lb.
F.o.b. Pittsburgh or Cleveland	$2.25
F.o.b. Chicago	70, 10 and 5

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

Discounts to Jobbers
(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80 and 25
Milled standard set screws, case hardened	75 and 10
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread	80, 25 and 10
Upset set screws, sq. head, 1 in. and smaller	75, 10 and 10
Upset set screws, 1⅛ in. and larger	75 and 10
Milled studs	70

SEMI-FINISHED STEEL

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	$26.00
Rerolling, 4-in. and under 10-in., Youngstown	26.00
Rerolling, 4-in. and under 10-in., Cleveland	26.00
Rerolling, 4-in. and under 10-in., Chicago	29.00
Forging quality, Pittsburgh	33.00
Forging quality, Youngstown	33.00

Sheet Bars

(Open-Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$26.00
Youngstown	26.00
Cleveland	26.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$26.00
Youngstown	26.00
Cleveland	26.00

(*Turn to next page*)

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$37.00
Cleveland	37.00
Chicago	38.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.00 to $2.15
Foundry, f.o.b. Connellsville prompt	3.00 to 4.25
Foundry, by-product, Chicago ovens	7.00
Foundry, by-product, New England, delivered	10.00
Foundry, by-product, Newark or Jersey City, del'd	8.35 to 8.75
Foundry, by-product, Phila.	9.00
Foundry, by-product, Cleveland, delivered	7.82
Foundry, Birmingham	5.00
Foundry, by-products, St. Louis, f.o.b. ovens	8.00
Foundry, by-products, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.50
Mine run coking coal, f.o.b. W. Pa.	1.50 to 1.60
Gas coal, ¾-in., f.o.b. Pa. mines	1.70 to 1.80
Mine run gas coal, f.o.b. Pa. mines	1.50 to 1.60
Steam slack, f.o.b. W. Pa. mines	0.50 to 0.65
Gas slack, f.o.b. W. Pa. mines	0.50 to 0.65

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.

No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. f.o.b. Baltimore

No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. del'd Chicago

No. 3 industrial fuel oil	2.65c.
No. 5 industrial fuel oil	2.45c.

Per Gal. f.o.b. Cleveland

No. 3 industrial fuel oil	4.62½c.
No. 4 distillate	4.00c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works: High-heat Duty Brick	Intermediate Duty Brick
Penn.	$35.00	$25.00 to $30.00
Maryland	35.00	25.00 to 30.00
New Jer.	$44.00 to 57.00	
Ohio	35.00	25.00 to 30.00
Kentucky	35.00	25.00 to 30.00
Missouri	35.00	30.00
Illinois	35.00	25.00 to 30.00
Ground fire clay, per ton	6.50	

Chrome Brick

	Per Net Ton
Standard size	$42.50

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$38.00
Chicago	47.00
Birmingham	50.00
Silica clay, per ton	8.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$61.50
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	38.50
Domestic, f.o.b. Chewelah, Wash.	20.90

CAST IRON PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	$36.40 to $38.40
4-in., del'd Chicago	39.40 to 41.40
6-in. and larger, del'd New York	28.20
4-in., del'd New York	31.20
6-in. and larger, Birm'ham	$32.00 to 33.00
4-in., Birmingham	35.00 to 36.00

Class "A" and gas pipe, $3 extra.

Pig Iron, Ores, Ferroalloys

VALLEY

Per gross ton, f.o.b. Valley furnace:

Basic	$14.00
Bessemer	15.00
Gray forge	14.50
No. 2 foundry	14.50
No. 3 foundry	14.00
Malleable	15.00
Low phos., copper free	25.00

Freight rate to Pittsburgh or Cleveland district, $1.89.

PITTSBURGH

Per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$14.00
No. 2 foundry	15.00
No. 3 foundry	14.50
Malleable	15.00
Bessemer	15.00

Freight rates to points in Pittsburgh district range from 69c. to $1.26.

CHICAGO

Per gross ton at Chicago furnace:

N'th'n No. 2 fdy.	$16.00
N'th'n No. 1 fdy.	16.50
Malleable, not over 2.25 sil.	16.00
High phosphorus	16.00
Lake Super. charcoal, sil. 1.50, by rail	23.17
Southern No. 2 fdy.	16.14
Low phos., sil. 1 to 2, Copper free	27.50
Silvery, sil. 8 per cent	23.67
Bess. ferrosil'n, 15 per cent	28.92

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including a switching charge.

ST. LOUIS

Per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$17.50
Malleable, f.o.b. Granite City	17.50
Northern No. 2 fdy., del'd St. Louis	$18.30 to 18.80
Southern No. 2 fdy. del'd	14.56
Northern malleable, del'd	18.30 to 18.80
Northern basic, deliv'd	18.30 to 18.80

Freight rates 83c. (average) Granite City to St. Louis; $2.30 from Chicago; $4.56 from Birmingham.

NEW YORK

Per gross ton, delivered New York district:

*Buffalo, No. 2, del'd east N. J.	$17.41 to $17.66
East Pa. No. 2 fdy.	15.52
East Pa. No. 2X fdy.	16.02

Freight rates: $1.52 to $2.63 from eastern Pennsylvania.

*Prices delivered to New Jersey cities having rate of $3.41 a ton from Buffalo.

BUFFALO

Per gross ton, f.o.b. furnace:

No. 2 fdy.	$16.00
No. 2X fdy.	16.50
No. 1 fdy.	17.50
Malleable, sil. up to 2.25	16.50
Basic	15.50
Lake Superior charcoal, del'd	23.41

NEW ENGLAND

Per gross ton delivered to most New England points:

*Buffalo, sil. 1.75 to 2.25	$19.04 to $20.04
*Buffalo, sil. 2.25 to 2.75	19.04 to 20.04
†Buffalo, sil. 1.75 to 2.25	17.41 to 18.91
†Buffalo, sil. 2.25 to 2.75	17.41 to 18.91
*Ala., sil. 1.75 to 2.25	19.74
*Ala., sil. 2.25 to 2.75	20.24
†Ala., sil. 1.75 to 2.25	15.88
†Ala., sil. 2.25 to 2.75	16.28

Freight rates: $5.05 all rail from Buffalo, and $3.41 to $3.91 rail and water from Buffalo when $1 barge and $2 to $2.50 New England freight rate are obtainable; $9.75 all rail from Alabama and $5.88 rail and water from Alabama to New England seaboard.

*All-rail rate.

†Rail-and-water rate.

CINCINNATI

Per gross ton, delivered Cincinnati:

Ala. fdy., sil. 1.75 to 2.25	$13.82
Ala. fdy., sil. 2.25 to 2.75	14.32
Tenn. fdy., sil. 1.75 to 2.25	13.82
N'th'n No. 2 foundry	$17.01 to 17.59
S'th'n Ohio silvery, 8%	21.02

Freight rates, $2.02 from Ironton and Jackson, Ohio; $3.82 from Birmingham.

PHILADELPHIA

Per gross ton at Philadelphia:

East. Pa. No. 2	$14.84
East. Pa. No. 2X	15.34
East. Pa. No. 1X	15.84
Basic (del'd east. Pa.)	16.00
Malleable	$18.00 to 18.50
Stand. low phos. (f.o.b. east. Pa. furnace)	22.00 to 23.00
Con. b'r'g low phos. (f.o.b. furnace)	22.00 to 22.50
Va. No. 2 plain	22.04
Va. No. 2X	22.54

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 84c. to $1.79 from eastern Pennsylvania furnaces: $4.67 from Virginia furnaces.

CLEVELAND

Per gross ton at Cleveland furnace:

N'th'n No. 2 fdy. (local delivery)	$15.50
S'th'n fdy. sil. 1.75 to 2.25	16.14
Malleable (local delivery)	15.50
Ohio silvery, 8 per cent	21.87
Stand. low. phos., Valley	25.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 55c. average local switching charge; $3.12 from Jackson, Ohio; $6.14 from Birmingham.

BIRMINGHAM

Per gross ton, f.o.b. Birmingham dist. furnace:

No. 2 fdy., 1.75 to 2.25 sil.	$11.00
No. 2 soft, 2.25 to 2.75 sil.	11.50
Basic	11.00

CANADA

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	$23.00 to $23.50

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	$68.00
Foreign, 80%, Atlantic or Gulf port, duty paid	68.00

Prices for lots of one carload or more; extras applied on less than carload lots.

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$25.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	$77.50
50% (less carloads)	85.00
75% (carloads)	126.00
75% (less carloads)	136.00
14% to 16% (f.o.b.) Welland, Ont., in carloads	31.00
14% o 16% (less carloads)	36.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
10%	$20.50	14%	$23.50
11%	21.00	15%	24.00
12%	21.50	16%	25.00
13%	22.50	17%	26.50

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
6%	$18.00	12%	$20.50
7%	18.50	13%	21.50
8%	18.75	14%	22.50
9%	19.00	15%	23.00
10%	19.50	16%	24.00
11%	20.00	17%	25.50

Other Ferroalloys

Ferrotungsten, per lb. wo. del., carloads	$1.08
Ferrotungsten, less carloads	$1.15 to 1.20
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	10.00c
Ferrochromium, 2% carbon	17.00c to 17.50c
Ferrochromium, 1% carbon	19.00c to 20.00c
Ferrochromium, 0.10% carbon	23.50c to 25.00c
Ferrochromium, 0.06% carbon	25.50c to 27.00c
Ferrovanadium, del., per lb. contained Va.	$3.05 to $3.30
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace in carloads	160.00
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base per gross ton	68.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton	$91.00
Silico spiegel, per ton, f.o.b. furnace, car lots	42.50
Ton lots or less, per ton	47.50
Silico-manganese, gross ton, delivered: 2.50% carbon grade	105.00
1% carbon grade	115.00
Spot prices	$5 a ton higher

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	8c. to 8.50c.
Iron, low phos., Swedish, average 68½% iron	9.00c.
Iron, basic or foundry, Swedish, average 65% iron	8.00c.
Iron, basic or foundry, Russian, aver. 63% iron (nom.)	9.00c.
Manganese, Caucasian, washed 52%	24.00c.
Manganese, African, Indian, 50-52%	23c. to 24c.
Manganese, Brazilian, 46 to 48%	21c. to 22c.

	Per Gross Ton
Tungsten, Chinese wolframite	$10.75 to $11.00
Tungsten, domestic scheelite	$10.00 to 10.50
Chrome, 45%, Cr_2O_3, crude, c.i.f. Atlantic seaboard	18.00
Chrome, 48%, Cr_2O_3, c.i.f. Atlantic seaboard	20.00

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5, Kentucky and Illinois mines, freight allowed, Pittsburgh basis	$20.31
No. 2 lump, 85-5, Kentucky and Illinois mines, freight allowed, Pittsburgh basis	22.31
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	17.00 to 17.40
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	32.00

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$8.00 to $8.50
No. 2 heavy melting steel	6.50 to 7.00
No. 2 railroad wrought	8.00 to 8.50
Scrap rails	8.00 to 8.50
Rails 3 ft. and under	10.50 to 11.00
Sheet bar crops, ordinary	8.00 to 8.50
Compressed sheet steel	7.50 to 8.00
Hand bundled sheet steel	6.50 to 7.00
Hvy. steel axle turnings	7.00 to 7.50
Machine shop turnings	5.00 to 5.50
Short shov. steel turnings	4.50 to 5.00
Short mixed borings and turnings	4.50 to 5.00
Cast iron borings	4.50 to 5.00
Cast iron carwheels	8.00 to 8.50
Heavy breakable cast	8.00 to 8.50
No. 1 cast	8.50 to 9.50
Railr. knuckles and couplers	8.50 to 9.00
Rail. coil and leaf springs	8.50 to 9.00
Rolled steel wheels	8.50 to 9.00
Low phos. billet crops	10.50 to 11.00
Low phos. sheet bar crops	10.50 to 11.00
Low phos. plate scrap	9.00 to 9.50
Low phos. punchings	9.00 to 9.50
Steel car axles	10.00 to 10.50

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$5.00 to $5.50
Shoveling steel	5.00 to 5.50
Frogs, switches and guards	5.00 to 5.50
Hydraulic comp. sheets	4.00 to 4.50
Drop forge flashings	3.50 to 4.00
No. 1 busheling	4.00 to 4.50
Rolled carwheels	6.50 to 7.00
Railroad tires	7.50 to 8.00
Railroad leaf springs	7.50 to 8.00
Axle turnings	4.00 to 4.50
Steel couplers and knuckles	5.50 to 6.00
Coil springs	7.50 to 8.00
Axle turnings (elec. fur.)	4.50 to 5.00
Low phos. punchings	7.00 to 7.50
Low phos. plates, 12 in. and under	6.50 to 7.00
Cast iron borings	2.00 to 2.50
Short shoveling turnings	2.00 to 2.50
Machine shop turnings	2.75 to 3.25
Rerolling rails	6.75 to 7.25
Steel rails, less than 3 ft.	7.50 to 8.00
Steel rails, less than 2 ft.	8.00 to 8.50
Angle bars, steel	6.50 to 7.00
Cast iron carwheels	5.50 to 6.00
Railroad malleable	5.00 to 5.50
Agricultural malleable	5.00 to 5.50
*Relaying rails, 56 to 60 lb.	15.00 to 17.00
*Relay rails, 65 lb. and up	18.00 to 23.00

	Per Net Ton
Iron angle and splice bars	$5.25 to $5.75
Iron arch bars, transoms	4.50 to 5.00
Iron car axles	10.50 to 11.00
Steel car axles	7.00 to 7.50
No. 1 railroad wrought	3.75 to 4.25
No. 2 railroad wrought	4.75 to 5.25
No. 1 busheling	3.50 to 4.00

No. 2 busheling	$2.00 to	$2.50
Locomotive tires, smooth	7.50 to	8.50
Pipes and flues	2.50 to	3.00
No. 1 machinery cast	6.00 to	6.50
Clean automobile cast	6.25 to	6.75
No. 1 railroad cast	5.25 to	5.75
No. 1 agricultural cast	5.00 to	5.50
Stove plate	5.25 to	5.75
Grate bars	5.00 to	5.50
Brake shoes	5.50 to	6.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$6.00 to	$6.50
No. 2 heavy melting steel	4.50 to	5.00
No. 1 railroad wrought	7.00 to	7.50
Bundled sheets	4.00 to	4.50
Hydraulic compressed, new	4.50 to	5.00
Hydraulic compressed, old	4.00 to	4.50
Machine shop turnings	3.00 to	3.50
Heavy axle turnings	5.50 to	6.00
Cast borings (nom.)	3.00 to	3.50
Heavy breakable cast	7.50 to	8.00
Stove plate (steel works)	6.00 to	6.50
No. 1 low phos. heavy	9.50 to	10.00
Couplers and knuckles	6.50 to	7.00
Rolled steel wheels	6.50 to	7.00
No. 1 blast furnace (nom.)	3.00 to	3.50
Spec. iron and steel pipe	5.50 to	6.00
Shafting	10.00 to	11.00
Steel axles	13.50 to	14.00
No. 1 forge fire	5.50 to	6.00
Cast iron carwheels	8.00 to	8.50
No. 1 cast	8.00 to	8.50
Cast borings (chem.)	8.00 to	10.50
Steel rails for rolling	9.00 to	9.50

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$6.25 to	$6.75
No. 2 heavy melting steel	5.50 to	5.75
Compressed sheet steel	5.50 to	6.00
Light bundled sheet stampings	4.50 to	5.00
Drop forge flashings		5.00
Machine shop turnings	2.75 to	3.00
Short shoveling turnings	4.00 to	4.50
No. 1 busheling	5.00 to	5.50
Steel axle turnings	5.00 to	5.50
Low phos., billet crops	9.00 to	10.00
Cast iron borings	3.50 to	4.00
Mixed borings and short turnings	3.00 to	3.50
No. 2 busheling	3.00 to	3.50
No. 1 cast	6.50 to	7.00
Railroad grate bars	5.00 to	5.50
Stove plate	5.00 to	5.50
Rails under 3 ft.	8.50 to	9.00
Rails for rolling	8.50 to	9.00
Railroad malleable	7.25 to	7.50
Cast iron carwheels	7.00 to	7.50

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	$6.50 to	$7.00
No. 2 heavy melting scrap		5.00
Scrap rails	6.75 to	7.25
New hydraul. comp. sheets		5.00
Old hydraul. comp. sheets		4.00
Drop forge flashings		5.00
No. 1 busheling		5.00
Hvy. steel axle turnings		6.00
Machine shop turnings	4.00 to	4.50
Knuckles and couplers		10.00
Coil and leaf springs		10.00
Rolled steel wheels		10.00
Low phos. billet crops	10.00 to	10.50
Short shov. steel turnings	5.50 to	6.00
Short mixed borings and turnings	3.75 to	4.25
Cast iron borings	3.75 to	4.25
No. 2 busheling	3.50 to	4.00
Steel car axles	10.00 to	11.00
Iron axles	10.00 to	11.00
No. 1 machinery cast	9.00 to	9.50
No. 1 cupola cast	8.25 to	8.75
Stove plate	7.25 to	7.50
Steel rails, 3 ft. and under	9.50 to	10.00
Cast iron carwheels	8.00 to	9.00
Industrial malleable	7.00 to	7.50
Railroad malleable	7.00 to	7.50
Chemical borings	7.50 to	8.00

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	$7.00 to	$7.50
Scrap steel rails	7.50 to	8.00
Short shoveling turnings		4.00
Stove plate		6.00
Steel axles		7.00
Iron axles		7.00
No. 1 railroad wrought	4.50 to	5.00
Rails for rolling	8.00 to	8.50
No. 1 cast		8.00
Tramcar wheels		8.00
Cast iron borings, chem		8.50

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	$5.50 to	$6.00
No. 1 heavy melting	5.00 to	5.50
No. 2 heavy melting	4.50 to	5.00
No. 1 locomotive tires	4.75 to	5.25
Misc. stand-sec. rails	5.50 to	6.00
Railroad springs	6.50 to	7.00
Bundled sheets	3.50 to	4.00
No. 2 railroad wrought	4.50 to	5.00
No. 1 busheling	4.00 to	4.25
Cast iron borings and shoveling turnings	3.75 to	4.25
Iron rails	7.00 to	7.50
Rails for rolling	7.00 to	7.50
Machine shop turnings	2.50 to	3.00
Heavy turnings	4.25 to	4.75
Steel car axles	8.25 to	8.75
Iron car axles	12.50 to	13.00
Wrot. iron bars and trans.	5.00 to	5.50
No. 1 railroad wrought	3.50 to	4.00
Steel rails less than 3 ft.	8.50 to	9.00
Steel angle bars	6.00 to	6.50

Cast iron carwheels	5.00 to	5.50
No. 1 machinery cast	6.50 to	7.00
Railroad malleable	4.75 to	5.25
No. 1 railroad cast	5.75 to	6.25
Stove plate	5.50 to	6.00
Relay, rails, 60 lb. and under	16.00 to	16.50
Relay, rails, 70 lb. and over	20.00 to	21.00
Agricult. malleable	5.00 to	5.50

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel		$3.00
No. 2 heavy melting steel		1.50
Heavy melting steel (yard)	$1.50 to	2.00
No. 1 hvy. breakable cast	4.50 to	4.75
Stove plate (steel works)	2.25 to	2.75
Machine shop turnings	0.50 to	1.00
Short shoveling turnings	0.50 to	1.00
Cast borings	0.50 to	1.00
No. 1 blast furnace	0.50 to	1.00
Steel car axles	8.00 to	8.50
Iron car axles (nom.)	14.00 to	14.50
Spec. iron and steel pipe	2.00 to	2.50
Forge fire		3.25
No. 1 railroad wrought	4.00 to	4.50
No. 1 yard wrought, long	3.25 to	3.50
Rails for rolling	5.00 to	5.50
No. 1 cast	5.00 to	5.25
No. 2 cast	4.00 to	4.50
Stove plate (foundry)		3.25
Malleable cast (railroad)	3.50 to	4.00
Cast borings (chemical)	6.00 to	6.50

Per gross ton, delivered local foundries:

No. 1 machinery cast	$7.00 to	$7.50
No. 1 hvy. cast (cupola size)	7.00 to	7.50
No. 2 cast	4.00 to	4.50

BOSTON

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$3.35 to	$3.50
Scrap T rails		3.35
Machine shop turnings	0.80 to	1.00
Cast iron borings		1.05
Bundled skeleton, long	2.00 to	2.10
Forge flashings	3.00 to	3.50
Blast furnace scrap	0.90 to	1.00
Forge scrap	3.00 to	3.25
Shafting	9.50 to	10.00
Steel car axles	9.00 to	9.50
Wrought pipe	4.00 to	4.25
Rails for rolling	4.50 to	5.00
Cast iron borings, chemical	7.00 to	7.25

Per gross ton delivered consumers' yards:

Textile cast	$7.00 to	$7.50
No. 1 machinery cast	7.50 to	8.00
Stove plate	5.00 to	5.25
Railroad malleable	10.50 to	11.00

CINCINNATI

Dealers' buying prices per gross ton:

Heavy melting steel	$4.50 to	$5.00
Scrap rails for melting	6.00 to	6.50
Loose sheet clippings	1.00 to	1.50
Bundled sheets	3.25 to	3.75
Cast iron borings	2.75 to	3.25
Machine shop turnings	2.50 to	3.00
No. 1 busheling	3.75 to	4.25
No. 2 busheling	2.00 to	2.50
Rails for rolling	6.50 to	7.00
No. 1 locomotive tires	7.00 to	7.50
Short rails	8.00 to	8.50
Cast iron carwheels	6.00 to	6.50
No. 1 machinery cast	8.50 to	9.00
No. 1 railroad cast	7.50 to	8.00

Burnt cast	3.25 to	3.75
Stove plate	3.25 to	3.75
Agricultural malleable	7.00 to	7.50
Railroad malleable	7.50 to	8.00

DETROIT

Dealers' buying prices per gross ton:

Hvy. melting steel	$4.25 to	$4.75
Borings and short turnings	1.50 to	2.00
Long turnings	1.00 to	1.50
No. 1 machinery cast	7.00 to	7.50
Automotive cast	9.00 to	9.50
Hydraul. comp. sheets	3.75 to	4.25
Stove plate	3.25 to	3.75
New No. 1 busheling	3.25 to	3.75
Old No. 2 busheling	1.25 to	1.75
Sheet clippings	1.25 to	1.75
Flashings	3.00 to	3.75

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	7.00	$6.00
Rails, scrap	7.00	6.00
No. 1 wrought	6.00	8.00
Machine shop turnings	2.00	2.00
Boiler plate	5.00	4.50
Heavy axle turnings	2.50	2.50
Cast borings	2.00	2.00
Steel borings	2.00	2.00
Wrought pipe	2.00	2.00
Steel axles	7.00	9.00
Axles, wrought iron	7.00	11.00
No. 1 machinery cast	12.50	10.00
Stove plate	10.00	8.00
Standard carwheels	1.00	8.50
Malleable	10.00	8.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.60c.
Reinforcing steel bars	2.60c.
Cold-finished and screw stock—	
Rounds and hexagons	2.95c.
Squares and flats	3.45c.
Rands	2.95c.
Hoops	3.60c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.15c.
Galv. sheets (No. 24), 25 or more bundles	3.65c.
Hot-rolled sheets (No. 10)	3.10c.
Galv. corrug. sheets (No. 28), per square (less than 3750 lb.)	$3.74
Spikes, large	2.50c.
Small	2.75c. to 2.90c.
Boat	3.00c.
Track bolts, all sizes, per 100 count, 70 per cent off list	
Machine bolts, 100 count, 70 per cent off list	
Carriage bolts, 100 count, 70 per cent off list	
Nuts, all styles, 100 count 70 per cent off list	
Large rivets, base per 100 lb.	$3.00
Wire, black, soft ann'l'd, base per 100 lb.	2.75
Wire, galv. soft, base per 100 lb.	3.20
Common wire nails, per keg	2.35
Cement coated nails, per keg	2.35

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	2.75c.
Reinforcing bars, billet steel	1.65c. to 1.75c.
Rail steel reinforcement	1.45c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	2.95c.
Flats and squares	3.45c.
Bands, 7/8 in. (in Nos. 10 and 12 gages)	2.95c.
Hoops (No. 14 gage and lighter)	3.50c.
Hot-rolled annealed sheets (No. 22)	3.55c.
Galv. sheets (No. 24)	4.10c.
Hot-rolled sheets (No. 10)	3.20c.
Spikes (7/8 in. and lighter)	3.45c.
Track bolts	4.30c.
Rivets, structural	3.75c.
Rivets, boiler	3.75c.
	Per Cent Off List
Machine bolts	70
Carriage bolts	70
Coach and lag screws	70
Hot-pressed nuts, sq., tap, or blank	70
Hot-pressed nuts, hex., tap, or blank	70
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	2.30
Cement c't'd nails, base per keg	2.30

NEW YORK

	Base per Lb.
Plates and struc. shapes	2.70c. to 3.10c.
Soft steel bars, small shapes	2.70c. to 3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	6.00c. to 6.50c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.52c.
Flats and squares	4.02c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	3.75c.
Bands	3.40c.
Hot-rolled sheets (No. 10)	3.00c. to 3.25c.
Hot-rolled ann'l'd sheets (No. 24*)	3.50c.
Galvanized sheets (No. 24*)	4.00c.
Long terne sheets (No. 24)	4.50c.
Standard tool steel	12.00c.
Wire, black annealed (No. 10)	3.60c.
Wire, galv. annealed (No. 10)	4.05c.
Tire steel, 1/2 x 1/2 in. and larger	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.75c.
Open-hearth spring steel, bases	4.50c. to 7.00c.
Common wire nails, base, per keg	$2.60

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	65 to 65 and 10
1 x 30 in. and smaller	65 to 65 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	65 to 65 and 10
¾ x 20 in. and smaller	65 to 65 and 10
Boiler Tubes:	Per 100 Ft.
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	94.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
Cold-fin. rounds, shafting, screw stock	3.31c.
Hot-rolled annealed sheets (No. 24)	3.80c.
Galv. sheets (No. 24)	4.35c.
Hot-rolled sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	3.85c.
Galv. corrug. sheets	4.40c.
Structural rivets	4.00c.
Boiler rivets	4.00c.
	Per Cent Off List
Tank rivets, 7/8 in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	70
Carriage bolts	70
Lag screws	70
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	70
Less than 200 lb.	60
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	70
Less than 200 lb.	60

PHILADELPHIA

	Base per Lb.
Plates, ¼-in. and heavier	2.45c.
Structural shapes	2.45c.
Soft steel bars, small shapes, iron bars (except bands)	2.45c.
Reinforc. steel bars, sq., twisted and deform.	2.30c.
Cold-fin. steel, rounds and hex.	3.50c.
Cold-fin. steel, sq. and flats	4.00c.
Steel hoops	3.00c.
Steel bands, No. 12 to 3/16-in., incl.	2.75c.
Spring steel	5.00c.
Hot-rolled annealed sheets (No. 24)	3.55c.
Galvanized sheets (No. 24)	3.75c.
Hot-rolled and annealed sheets (No. 10)	3.05c.
Diam. pat. floor plates, ¼ in.	5.00c.
Swedish iron bars	5.60c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	2.95c.
Soft steel bars	2.75c.
Reinforc. steel bars	1.75c. to 1.95c.
Cold-fin. rounds and hex.	2.95c.
Cold-fin. flats and sq.	3.45c.
Hoops and bands, No. 12 to 7/8 in., inclusive	3.00c.
Hoops and bands, No. 13 and lighter	3.55c.
Cold-finished strip	*5.55c.
Hot-rolled annealed sheets (No. 24)	3.25c.
Galvanized sheets (No. 24)	3.75c.
Hot-rolled sheets (No. 10)	3.00c.
Black ann'l'd wire, per 100 lb.	$2.75
No. 9 galv. wire, per 100 lb.	3.20
Com. wire nails, base per keg	2.35

*Net base, including boxing and cutting to length.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
New billet reinforc. bars	3.00c.
Rails steel reinforc. bars	3.00c.
Hoops	3.90c.
Bands	3.20c.

Cold-fin. rounds and hex.	3.29c.
Squares	3.75c.
Hot-rolled annealed sheets (No. 24)	3.75c.
Galv. sheets (No. 24)	4.25c.
Hot rolled sheets (No. 10)	3.30c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg (10 to 49 kegs)	2.65
Larger quantities	2.50
Cement c't'd nails, base 100-lb. keg	2.95
Chain, per 100 lb.	10.25
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$17.50
4-in.	36.00
Lap-welded steel boiler tubes, 2-in.	16.50
4-in.	34.50

BUFFALO

	Base per Lb.
Plates and struc. shapes	3.25c.
Soft steel bars	3.00c.
Reinforcing bars	2.65c.
Cold-fin. flats and sq.	3.65c.
Rounds and hex.	3.15c.
Cold-rolled strip steel	5.25c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.10c.
Bands	3.35c.
Hoops	3.90c.
Hot-rolled sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$2.45
Black wire, base per 100 lb.	3.20

BOSTON

	Base per Lb.
Plates	*3.35c.
Structural shapes	*3.35c.
Soft steel bars, small shapes	*3.25c.
Reinforcing bars	3.10c. to 3.25c.
Iron bars—	
Refined	3.25c.
Best refined	4.60c.
Spring steel, open-hearth	5.00c.
Tire steel	4.50c. to 4.75c.
Bands	*3.75c. to 4.25c.
Hoop steel	4.90c. to 5.40c.
Cold-rolled steel—	
Rounds and hex.	3.50c. to 5.50c.
Squares and flats	4.00c. to 6.00c.
Rivets, structural or boiler	4.80c.
	Per Cent Off List
Machine bolts	70
Carriage bolts	70
Lag screws	70
Hot-pressed nuts	40 and 10
Cold-punched nuts	40 and 10
Stove bolts	70 and 10

*Base price (250 to 999 lb.); less than 250 lb., add 50c. per 100 lb.; 1000 to 7999 lb., deduct 15c.; 8000 to 14,999 lb., deduct 25c.; 15,000 lb. and larger lots, deduct 35c.

PACIFIC COAST

	Base Per Lb. San Francisco	Los Angeles	Seattle
Plates and struc. shapes, ¼-in. and heavier	3.25c.	3.30c.	3.00c.
Soft steel bars	3.25c.	3.30c.	3.00c.
Reinforcing bars	3.00c.	3.00c.	3.00c.
Hot-rolled annealed sheets (No. 24)	3.95c.	4.20c.	4.50c.
Hot-rolled sheets (No. 10)	3.50c.	3.50c.	4.00c.
Galv. sheets (No. 24)	4.55c.	4.50c.	5.00c.
Struc. rivets, ½ in. and larger, less than 1000 lb.	5.00c.	5.00c.	4.00c
Cold-finished steel			
Rounds	5.50c.	5.50c.	4.50c.
Squares and hexagons	6.75c.	6.75c.	5.75c.
Flats	7.25c.	7.25c.	6.75c.
Common wire nails, base per keg in less carloads	$2.90	$2.90	$3.00

Plates, shapes, bars, bands and hot-rolled sheets, No. 16 gage and heavier, subject to reductions for quantity. Cold-finished quotations based on 100 lb. minimum quantity.

Fabricated Structural Steel

Lettings in Good Volume—New Projects Slightly Lower

TOTAL bookings of 28,700 tons, making one of the largest totals for any week this year, compare with 7600 tons in the previous week and 17,300 tons two weeks ago. A building for the Department of Justice, Washington, accounts for 10,400 tons. New projects of 11,300 tons compare with 12,800 tons last week. Highway bridges will require more than 8800 tons; the largest inquiry, 1700 tons, is for a bridge over the Shark River in New Jersey. Awards follow:

NORTH ATLANTIC STATES

State of Maine, 100 tons, bridge, to Lackawanna Steel Construction Corpn.

State of New York, 330 tons, highway bridge in Orange County, to American Bridge Co.

New York Central Railroad, 9000 tons, loop track viaduct, West Thirtieth Street, to American Bridge Co.

New York, 200 tons, clarifiers, Ward's Island, to Lackwanna Steel Construction Corpn.

Union City, N. J., 200 tons, Sheffield Farms building, to Selbach-Meyer Co.

Newark, N. J., 145 tons, garage for Alling Corpn., to Albert Smith & Sons.

Washington County, N. Y., 150 tons, State bridge, to Lackawanna Steel Construction Corpn.

Angelica, N. Y., 100 tons, State bridge, to Lackawanna Steel Construction Corpn.

Auburn, N. Y., 400 tons, State bridge, to McClintic-Marshall Corpn.

Deposit, N. Y., 200 tons, bridge for Erie Railroad, to American Bridge Co.

Pocantico Hills, N. Y., 260 tons, farm buildings, to Belmont Iron Works.

Rochester, Pa., 1400 tons, State highway bridge, to American Bridge Co.

Mifflin County, Pa., 125 tons, highway bridge, to Jones & Laughlin Steel Corpn.

Washington, 10,400 tons, building for Department of Justice, to McClintic-Marshall Corpn.

Washington, 10,500 tons, Department of Labor-Interstate Commerce Commission building, with auditorium, to McClintic-Marshall Corpn.; James Stewart & Co., Inc., general contractor. Previously reported to Fort Pitt Bridge Works Co.

SOUTH AND SOUTHWEST

State of Virginia, 165 tons, State highway bridges, to Roanoke Bridge & Iron Co.

Albuquerque, N. M., 200 tons, athletic stadium for University of New Mexico, to Virginia Bridge & Iron Co.

CENTRAL STATES

Piqua, Ohio, 470 tons, building for Val Decker Packing Co., to Fort Pitt Bridge Works Co.

Norwood, Ohio, 230 tons, bridges for Pennsylvania Railroad, to American Bridge Co.

Jackson, Mich, 300 tons, post office, to Whitehead & Kales, Inc.

Granite Falls, Minn., 115 tons, steam plant, to Minneapolis-Moline Power Implement Co.

State of South Dakota, 250 tons, bridge over Cheyenne River, to Pittsburgh-Des Moines Steel Co.

Milwaukee Road, 110 tons, bridges, to American Bridge Co.

Sauk County, Wis., 135 tons, highway bridge, to Lakeside Bridge & Steel Co.

WESTERN STATES

Hoover Dam, 2900 tons, bulkhead gates, to Consolidated Steel Corpn.

Portland, Ore., 200 tons, Irvington school, to A. Young & Sons.

Los Angeles, 317 tons, additional tonnage on Firestone Avenue bridges, to Kyle Steel Construction Co.

CANADA

Montreal, 300 tons, substation for Montreal Light, Heat & Power Co., to Dominion Bridge Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Bridgeport, Conn., 600 tons, post office; bids June 30.

State of New Jersey, 1700 tons, bridge over Shark River, route 4, Belmar-Avon; bids July 18.

Newark, N. J., 8000 tons, post office; N. P. Severin Co., Chicago, general contractor.

Jefferson County, N. Y., 370 tons, highway bridge.

Batavia, N. Y., 100 tons, Veterans' Hospital.

New York, 1000 tons, apartment building, 65 Park Avenue; bids July 12.

New York, 800 tons, maternity hospital on Grand Concourse.

SOUTH AND SOUTHWEST

State of Texas, 970 tons; highway bridges in Wood County, 238 tons; Delta-Lamar counties, 456 tons and Bronte County, 276 tons; bids June 30.

Creek County, Okla., 500 tons, two highway bridges.

State of Oklahoma, 1100 tons, highway bridges.

CENTRAL STATES

St. Louis, 4000 tons, municipal auditorium; Boaz-Kiel Construction Co., low bidder on general contract.

State of Missouri, 650 tons, highway bridge.

Marseilles, Ill., 725 tons, bridge over Illinois River.

State of Illinois, 200 tons, highway bridge in Henderson County; Vincennes Bridge Co., low bidder.

State of Indiana, 325 tons, two highway bridges.

States of Wisconsin and Iowa, 1000 tons, highway bridges.

Channahon, Ill., 1250 tons, highway bridge over Illinois River.

WESTERN STATES

Los Angeles, 100 tons, Southern California Gas Co. warehouse.

FABRICATED PLATE

NEW PROJECTS

Los Angeles, 400 tons, boiler for city steam plant at Wilmington; bids to be opened July 2.

Pipe Lines

Peninsular Construction Co., Detroit, recently organized by George R. Cooke, head of George R. Cooke Co., Penobscot Building, engineer, and associates, with capital of $500,000, plans welded steel pipe line, 18 or 20-in. diameter, from gas fields near Mount Pleasant, Mich., to Detroit and vicinity, including branch lines to Flint and Pontiac, for commercial natural gas service. Line will be about 160 miles long. Cost over $1,500,000, with pressure and distributing stations. Walter J. Lehner, Mount Clemens, Mich., former county road engineer, Macomb County, will be in charge of surveys.

Standard Oil Co. of Kansas, Neodesha, Kan., is securing right-of-ways for 150-mile oil pipe line through McPherson County, with extension to refining plant at Neodesha. Project will include several large pumping plants.

Humble Oil & Refining Co., Houston, Tex., is planning crude oil pipe line from Conroe oil field district, Montgomery County, to connection with main trunk line near Harris, Tex., running to refinery at Houston, about 25 miles. Cost $300,000.

Panther Valley Water Co., Tamaqua, Pa., has awarded 3300 tons of plates for a pipe line to McClintic-Marshall Corpn.

Long Beach, Cal., awarded 400 tons in sizes from ¾ in. to 8 in. to W. W. Pipe Shop.

New York, 150 tons, 96-in. plate, ½ in. thick, for tanks on Kings County Hospital; bids taken.

Reinforcing Steel

AWARDS

Brooklyn, 200 tons, loft building, to Rawlins Co., New York.

State of New Jersey, 300 tons, highway construction, route 42, section 8, to Truscon Steel Co.

State of New Jersey, 472 tons, bridge over Shrewsbury River, route 36, to Kalman Steel Corpn.

Washington, 2200 tons, Department of Agriculture extensible building, to Sweet's Steel Co., Williamsport, Pa.

Des Moines, Iowa, 680 tons, Veterans' Hospital, to an unnamed bidder.

State of Indiana, 200 tons, road work, to Calumet Steel Co.

State of Illinois, 100 tons, road work, to Calumet Steel Co.

Jackson, Mich., 280 tons, post office, to Concrete Engineering Co.

Van Nuys, Cal., 100 tons, city hall, to Southgate Iron Works.

Vernon, Cal., 200 tons, city power house, to Kyle Steel Construction Co.

NEW REINFORCING BAR PROJECTS

Cambridge, Mass., 200 tons, telephone exchange.

Bridgeport, 220 tons, post office; bids opened June 30.

State of New Jersey, 290 tons, bridge over Shark River, route 4, Belmar-Avon; bids open July 18.

Batavia, N. Y., unstated tonnage, Veterans' Hospital.

Buffalo, 300 tons, State Armory.

Buena Vista, Md., 100 tons, sanitarium; McCormick & Lenham, general contractors.

State of Indiana, 600 tons, road work, bids to be opened July 12.

St. Louis, 2500 tons, municipal auditorium; Boaz-Kiel Construction Co., low bidder for general contract.

Seattle, 333 tons, additional tonnage on Black Diamond Canyon bridge, bids called June 27.

Cast Iron Pipe

Boston Metropolitan Sewer Commission placed 650 tons of 48-in. with Warren Foundry & Pipe Corpn.

Lathams Corner, N. Y., is in the market for 100 tons of 6-in.

Bethel, Ohio, placed 350 tons of 4- to 8-in. with Central Foundry Co.

Kingsford, Mich., (mail Iron Mountain) placed 11,500 lin. ft. of 4- and 6-in. class C and specials with Traverse City Iron Works.

Eau Claire, Wis., placed 2400 lin. ft. of 6-in. class C with R. D. Wood & Co.

Laguna Beach, Cal., awarded 240 tons 18-in., to American Cast Iron Pipe Co.

Marin Meadows, Cal., Army Quartermaster placed 400 tons with United States Pipe & Foundry Co. for the water system at Hamilton Field.

Railroad Equipment

Federal Railroad Administration, Vienna, Austria, is arranging fund of $15,000,000 for purchase of new rolling stock, about one-half to be used for all-steel passenger coaches to replace third class wooden cars.

North Western Railway Co., Lahore, India, office of general manager, asks bids until July 18 for three locomotives and tenders, 33 in. gage.

Is a New Plant Location the Way Out?

(*Concluded from page* 1387)

per cent for multi-story buildings, the difference being in stairways, elevators, thicker walls and more or larger columns. Operating efficiency of one-story space lies in straight-line production, elasticity of layout, and easier supervision of operations.

When the Addressograph Co., Chicago, bought the Multigraph Co., Cleveland, last year, both operations were merged into one new central plant in Euclid, a suburb of the latter city. This is a large one-story building, 500 ft. wide and 600 ft. long, with maximum daylight furnished by continuous steel sash on sides and monitor V roof. The floor is lined with wood blocks. Rows of columns are 60 ft. apart, with 20 ft. between columns in each row. A three-story office building is in front. The site lies between the New York Central and the Nickel Plate Railroads, and is served by sidings from both.

Nearby is another large new one-story plant, a branch factory of the Chase Brass & Copper Co., Waterbury, Conn. This building is in two parallel units, each 225 ft. wide and 1000 ft. long, with sawtooth roof. The power house has three 500-hp. boilers. The site of 60 acres is served by sidings from the New York Central and Nickel Plate Railroads. As the operations require a water supply of 3,000,000 gal. a day, a private water main has been run for two miles to Lake Erie, and thence 2000 ft. out into the lake.

Cleveland was selected as the Midwest branch plant location of the Chase company because it is a rich source for brass and copper orders, and the diversity of orders in the section indicates a steady growth of manufacturing and other trades.

The Meurer Steel Barrel Co. moved from Long Island City to Newark, most of its metropolitan area customers, oil, alcohol, paint and chemical firms, being located in the North Jersey region. Supplies of steel from the West come in one day earlier to the new location. Most of the force of 100 men moved their families along with the plant. Transfer of operations was effected by movement of one line of products at a time.

The new plant is of one-story construction, 175 ft. wide and 300 ft. long, with 25-ft. ceilings. A two-story office structure constitutes the front end of the plant, which is served by a railroad siding running along the building.

Another example of a move from the congested section of New York to the more open spaces is the removal of the N. P. Nelson Iron Works of Brooklyn to a new location at Allwood, N. J., near Passaic. This company manufactures conveyors, road-building machinery and steel and aluminum truck bodies.

A modern one-story plant of 78,000 sq. ft. was constructed on an important highway for the advertising value to be derived, and several miles from the congested section where land values would be prohibitive. The highway and a rail siding provide quick transportation to all points. The removal was conducted largely in the company's own trucks, with the heavy machinery going by rail. Most of the employees moved with the company.

The Lexington Electric Co., which makes panel boards, switchboards and steel inclosures for electrical purposes, moved from New York to a Newark location, near the superhighway leading directly to the tunnels under the Hudson River. From an old cramped plant in New York, the company moved into a two-story building of 30,000 sq. ft., with extra land for expansion.

This company had to move during peak operations. Duplicate line shafting and hangers were installed in the new place, and the complete transfer of operations was effected in three weeks. Most of the employees came along with the firm.

Saving Thousands of Dollars on Freight

One reason for the higher price level in the United States is that it is common to haul raw or semi-finished materials long distances to factories, and then ship back the finished goods even greater distances to markets throughout the country. This expensive practice is resulting in the movement of many plants, or the establishment of branch plants.

The Spring Perch Co., maker of steel leaf springs for all uses, has been established in Bridgeport, Conn., for the last 50 years. Its steel now comes from mills more than 500 miles to the West, and in addition many new customers have been added in that direction, such as automotive plants in the Middle West.

It was therefore logical for this company to consider a location near some steel basing point center, such as Pittsburgh or Buffalo, to secure its steel at practically no freight charge.

Buffalo was chosen for the new location, with a plant adjacent to the steel mills at the suburb of Lackawanna. The steel can be obtained as needed, saving storage charges, and the only freight cost is a per car switching charge.

Quite as important, the finished product can be shipped by water to important lake cities such as Cleveland and Detroit, at a saving of 20 to 30 per cent under rail rates.

Another advantage of Buffalo is that the same supervision can direct both the Buffalo operations and a Canadian branch plant, should this company desire to have such a plant to eliminate the increased tariff on sales to Canada and the British Empire. Buffalo is only 18 miles from the Canadian border. Finally, due to Niagara Falls, power rates in the Buffalo region are among the lowest in the world.

Similar reasons led to the location in Buffalo of the Buffalo Tank Corpn., maker of all-welded steel tanks and containers, welded steel buildings, and general steel plant plate construction of a welded nature. This company, in selecting Buffalo over other steel price basing centers, considered the important fact that more people and industries are within 500 miles of Buffalo than within an equal radius from other steel basing point centers.

Selecting the Right City and Getting Started

Some manufacturers dread the idea of having to visit scores of cities in order to find the one best place, and then wonder whether they have judged correctly. They also worry in advance about the difficulties of breaking in labor, making friendships in the new town, and securing the cooperation of local authorities.

When we consider the time wasted by manufacturers in looking for locations, and the wrong choices that are often made, one wonders why a relatively small sum is not expended to engage an engineering firm or others with knowledge of costs and communities, in view of the tremendous importance of a good location as against a poor one.

The following branch plant location handled by a firm of engineers illustrates some of the mechanics of finding a location and getting started.

A manufacturing concern in Michigan was receiving wood from the South for use in making certain parts. It was decided to stop the wood at a half-way point in the upper South, and make the parts there where labor was cheaper.

Cities along the line of transportation were studied, small places being eliminated, because of the large amount of labor required. Five communities were finally selected. Three of these were eliminated for lack of available factory space, the owners finally deciding that they would not erect a new building.

The two remaining cities were important centers in their respective States, with labor and other costs about the same. The largest city was eliminated because of a costly and somewhat unsuitable factory building; furthermore it was served by one railroad only. In addition, local ordinances for wiring, exhaust systems, etc., were unsatisfactory.

In the city finally selected, labor supply and costs were satisfactory,

and it was possible to pick up at a bargain an old war plant. This was an advantage, as it enabled the engineers largely to rebuild and change it to meet the exact needs of the company. Furthermore, the site was served by sidings from two railroads.

Excellent civic cooperation was forthcoming. A water main was run out to the plant and the trolley company extended its tracks to the property. The city council amended the ordinances on wiring and exhaust systems to meet modern conditions.

Green labor from the surrounding hills proved to be remarkably quick to learn on the machines, and was considered fairly skillful within one to two months, on a par with more experienced labor at the main plant of the company in the large Michigan metropolis. The work requires a large amount of skill. The breaking in was done by the engineers, in cooperation with company supervisors, and using a small nucleus of experienced workers from the main plant. Workers were trained in batches of 50 to 100, and the company gave the engineers sufficient time to allow for wastage and slowness. The testimony of engineers was that this country labor was more mature in action, more self-reliant and more willing, than city workers on similar work.

Although the operations are classed as hazardous, the accident rate of these new workers was considerably under that of the main plant.

A plant location study should be made by every concern, regardless of whether it intends to move or not. Such a study forces the officials to consider what the next 10 or 20 years may bring forth in shifting markets, changing products, plant space and labor required, etc. The viewpoint of outside men is of value to supplement the opinions of owners and officials.

Fundamentally, the future holds forth a picture of relatively declining population and actually increasing productive capacity. Competition is bound to be keener and keener. To make a sterling product that brings repeat orders, to give immediate service to customers and to keep costs down certainly requires efficient plant, willing workers and a location at the right point between the best markets and needed materials. All of these depend on the right location and factory space. Management and needed credit are also most efficient in a community with pleasant atmosphere and forward-looking bankers and business men. There are such places, and they deserve serious consideration in the manufacturer's future plans.

United States Steel Corpn. has acquired from Edward G. Budd Mfg. Co., Philadelphia, rights to the Budd system of stainless steel construction, including shot welding processes, for the use of its subsidiaries in the construction of ships, bridges and structural elements in buildings.

Ford V-8 Crankshaft Department

(*Concluded from page* 1393)

larger conveyor at the end of the building, which runs under the floor and outside the structure, finally discharging its contents at a place where the scrap metal can be conveniently hauled away.

The coolant for individual machines is supplied from a central overhead clean tank from which it flows by gravity to the machines. After being used, it flows through pipes to a filter tank where pumps draw it through the filters and return it to the clean-coolant tank. Filters are of the self-cleaning, metal disk type, using the principle of edge filtration and are kept in continuous rotation at a slow speed by means of a conventional motor, speed-reducer drive.

Operation of the entire unit is governed by the level of the liquid in the clean-coolant tank, the motors on both pump and filter going into action and cutting off at the same time. This arrangement makes the operation entirely automatic, the only labor involved being the cleaning out of the filter tank, which is divided into two sections, each with its filter unit. Thus, half of the tank can be cleaned out without interfering with the operation of the system as a whole.

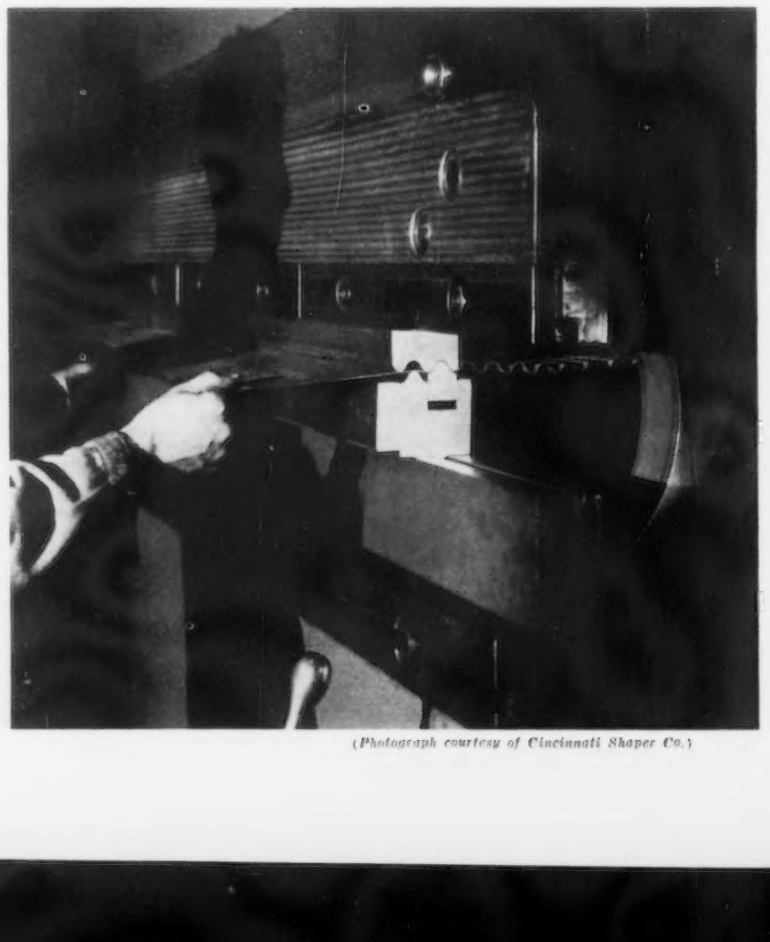
Use of this filtering system has shown that closer machining limits, better finish and longer tool or wheel life can be secured if the coolant is continuously filtered to remove chips and other foreign matter.

To prevent an unnecessary amount of coarse abrasive material from passing into the filtering tank, individual machine tools are equipped with large bags into which this material passes after the coolant is used. When the bags are filled, the operator detaches them and empties the scrap on to a conveyor.

The crankshaft of the Ford V-8 is short and rigid. When it enters the crankshaft department as a rough forging it weighs 80 lb.; when it leaves as a finished product it weighs 66 lb. During the passage through the department it is machined by the most modern methods and is held to tolerances as fine as those prescribed for cars selling in a much higher price range.

Corrugating Duralumin Airplane Sheets

Each stroke of this press brake puts a corrugation in the duralumin sheet, 10 ft. long, which is used as sheeting for metal airplanes. The raised portion of the die has a spring pad underneath. This part of the die clamps the corrugation previously formed, thus acting as a gage and holddown, causing the metal to flow evenly from one side and making accurate corrugations.



(*Photograph courtesy of Cincinnati Shaper Co.*)

Widia Tool Prices Reduced

Reduction in the prices of Widia cemented-carbide cutting tools and tips, including the new Widia-X for machining steel, has been announced by Thomas Prosser & Son, 15 Gold Street, New York, American representatives of Fried. Krupp, A. G., Essen, Germany. On tools the reduction, effective July 1, ranges from 10 to 50 per cent, depending primarily upon the size of the tip employed. Base prices on the tips themselves have been reduced from 10 per cent on the smallest tips to more than 40 per cent on the largest. It is stated further that labor charges for making the tools have been reduced considerably.

A new service, namely the supplying of "milled or brazed" tools ready for grinding by the user is also announced. Use of this service is said to permit substantial savings, especially in the case of small-size Widia-tipped bits, and when the fine finish and careful grinding of the standard tools are not required.

Revere Announces New Alloy—"Herculoy"

Revere Copper & Brass, Inc., has announced a new patented and trade-marked alloy called "Herculoy." It falls into the silicon bronze group, and according to Dr. R. A. Wilkins, metallurgical manager of the Revere organization, possesses the advantages of strength and corrosion resistance, which characterize the silicon bronzes, with special properties which render it more readily adaptable to fabricating operations than is usual with silicon bronzes. Its strength is comparable to that of low and medium carbon steel and its corrosion resistant qualities approximate those of pure copper.

Herculoy possesses a simple, single-phase structure, similar to that of alpha brass, thereby permitting through proper annealing a range of physical properties intermediate between the limits set for elongation and tensile strength, or up to 80 per cent and 120,000 lb. per sq. in. respectively, depending on the treatment.

This alloy affords, it is claimed, engineering designers and structural fabricators a non-rusting and non-magnetic metal, having among its other desirable qualities the ability to withstand extreme daily and seasonal temperature changes while over-stressed and exposed to weather, fog, gases, etc., and under such conditions it is not subject to stress corrosion cracking. In its wrought forms it is so ductile that it may be stressed to the yield point without danger. It also has great resistance to shock and is easily hot forged, according to the producer.

A distinctive feature is the inclusion of tin in its composition, it is pointed out. Through laboratory and practical tests, it has been found that tin exerts the peculiar effect of increasing the tensile strength and the ductility of this alloy simultaneously, and that, in addition to generally improving the physical properties, the tin exerts a pronounced influence on the resistance to corrosion.

Herculoy is available at present in the form of sheets and plates; rolls and strips; rods, bars, and shafting; die pressed or hammered forgings; rivets; welding rods and in ingot form for sand castings. In sheet and plate form, it is claimed particularly suitable for tank construction. Its resistance to corrosion renders lining unnecessary and it can be used in the same weight as steel. It is very readily welded with filler rod of the same composition.

Gigantic Annealing Furnace Put in Operation

MEASURING 18 ft. by 18 ft. by 87 ft., the car-type annealing furnace recently placed in operation at the Warren, Pa., works of the Struthers Wells-Titusville Corpn., is rated as the largest of its kind in the world. It is to be used in stress relieving fusion welded pressure vessels and annealing welded alloy steel equipment at temperatures as high as 2150 deg. Fahr. The furnace has capacity to handle the largest and heaviest vessels that the railroads can transport.

In the accompanying illustration a high-pressure creosoting cylinder, 6 ft. in diameter and 65 ft. long, is shown entering the furnace for heat treatment. This vessel is of Struthers-Weld tempered-arc process construction, and complies with the A.S.M.E. code requirements. The Struthers-Weld process, developed by the company for welding carbon and alloy steels, is said to produce better physical, chemical and corrosion resistant characteristics in the weld and adjacent metal than exists in the material of which the vessel is constructed.

The furnace embodies a number of unique features. Automatic heat control, which restricts temperature variation to a very close degree, is effected through the use of eight heating zones with the same number of blowers and 40 burners, each zone having automatic control valves and recorders. The furnace has three motor-operated doors; the one suspended over the center makes it possible to divide the furnace in half, thereby permitting economical heat treatment of smaller objects. When the furnace is operating at 2150 deg. Fahr., the temperature in the dead air space surrounding the lower portion of the car rarely exceeds 1300 deg.

The car carrying the objects to be annealed operates on its own tracks laid within the furnace, and an interesting feature of its design is the use of roller-bearing wheels. To protect these roller bearings against the heat of the furnace a sand seal device is employed, serving very effectively as an insulator. Ni-Resist cast iron is used for sand seal castings, that extend into the sand and thus form the seal.

Although natural gas is the fuel used, the furnace is also designed and equipped for oil firing.

PLANT EXPANSION AND EQUIPMENT BUYING

Machine Tool Demand Still at Low Ebb

Small Orders from an Automobile Builder and the Government Feature Quiet Market

MACHINE tool demand fails to disclose convincing evidences of a turn for the better. Cincinnati manufacturers received a few orders from the Government and from an automobile builder, but otherwise found the week unproductive of new business. The tools ordered by the motor car maker are for early use and, accordingly, the machine tool plants affected have speeded up production to make the deliveries asked for. Among the machines purchased were a crankshaft lathe and an undisclosed number of cutter grinders. The Government placed an order with a Cincinnati company for eight 10-in. lathes.

Aside from increased requests for figures from the automobile industry, there is little tangible inquiry in the market. At Chicago no action has been taken by the Milwaukee road on its recent inquiry. Similarly the prospective machine tool programs of other Western railroads are being held in abeyance, apparently until the steady decline in traffic is arrested.

NORTH ATLANTIC

Shadbolt Mfg. Co., 68-70 Flushing Avenue, Brooklyn, manufacturer of commercial automobile bodies, has leased its plant to John Morgan, Inc., 314 Eleventh Avenue, New York, mineral waters, and will transfer operations to an adjoining factory. Morgan company will equip plant for bottling works, with charging, capping, conveying and other machinery.

Superintendent, Army Transport Service, Brooklyn, asks bids until July 25 for construction of one all-welded steel barge (Circular 59).

Department of Correction, State Office Building, Albany, N. Y., has asked bids on general contract for new machine shop and other structures at Matteawan Hospital, Beacon, N. Y.

Sampson Tool Co., Inc., New York, has been organized by William B. Fisher, 602 Willoughby Avenue, Brooklyn, and associates to manufacture tools and other equipment.

New York Steam Corpn., 280 Madison Avenue, New York, has plans for extensions and improvements in steam generating plant at 222 Pearl Street, including steel stack work, etc. Cost over $50,000. W. H. Paine, company station, 417 East Thirty-fifth Street, is engineer.

New York Central Railroad, 466 Lexington Avenue, New York, has increased operations at locomotive shops at West Albany, N. Y., transferring over 150 men from shops at Depew, N. Y., to that point.

Carbide & Carbon Chemicals Corpn., 30 East Forty-second Street, New York, plans gasoline loading, storage and distributing plant on Blaine Island, Kanawha River, near works at South Charleston, W. Va. Cost over $45,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until July 5 for flexible steam hose (Schedule 8295) for Brooklyn yard.

Mohawk Giro, Inc., New York, has been organized by W. T. Sampson Smith, Short Hills, N. J., and Joseph S. McCormick, Lansdowne, Pa., to manufacture aircraft, equipment for generating steam and other mechanical specialties.

Robert Gair Co., Inc., New York, has been formed under Delaware laws to take over and expand company of same name at 420 Lexington Avenue, manufacturer of corrugated and fiber boxes and containers, with main plant at Piermont, N. Y. New organization plans acquisition and establishment of new complementary manufacturing units to expand and balance present line of container production.

R. B. Davis Co., 38 Jackson Street, Hoboken, N. J., has leased one-story factory, 125 x 200 ft., to be erected on Ferry Street, to Automatic Paper Machine Co., 311 Pine Street, Elizabeth, N. J., for corrugated paper and container manufacturing plant. General contract let to Walter Kidde Constructors, Inc., 140 Cedar Street, New York. Cost over $50,000 with equipment.

Lohe Products Corpn., Bayonne, N. J., has been organized by John Gilbertson and Frank Ziobro, 473 Broadway, Bayonne, and associates to operate a welding and metal works.

Gold Seal Mfg. Co., 5 Central Avenue, East Newark, N. J., manufacturer of radio tubes and equipment, is increasing production schedule. Plant has also recently started production on new television receiving equipment and is devoting part of output to manufacture of new photo-cell used for motion picture machines.

J. Frank Kavanaugh, Irvington, N. J., has leased one-story factory at 100 Coit Street for manufacture of wire and wire products. Mr. Kavanaugh was formerly an official of National Harris Wire Corpn., Newark, N. J.

Gould & Eberhardt, 480 Chancellor Avenue, Irvington, N. J., manufacturer of machinery and tools, has production under way on sizable order for special gear cutters for Soviet Russian Government.

Witherbee Storage Battery Co., Inc., Belleville, N. J., has been organized to take over and expand company of same name with plant at 355 Cortlandt Street, manufacturer of electric storage batteries, parts, etc.

Public Seating Co., Trenton, N. J., recently organized, has acquired plant and business of New Jersey Seating Co., Murray and Artisan Streets, manufacturer of metal frame school seats and kindred public furniture. New organization plans expansion and will increase plant facilities. R. J. Innis, formerly general manager for New Jersey company, is president and general manager of new company. Plant has been in receivership for several months.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until July 5 for one motor-driven metal planer (Schedule 8274) for Philadelphia yard.

Walker-Kepler Electric Co., Philadelphia, has been organized by John J. McElroy, Jr., Merion, Pa., and David G. Wilson, Bala, Pa., to manufacture electrical equipment and supplies.

Jannetti Body Co., Philadelphia, manufacturer of automobile bodies, has leased one-story building, 5000 sq. ft. floor space, at 1418-28 Melon Street, for new works.

Board of Public Education, Administration Building, Philadelphia, plans manual training department in new South Philadelphia high school. Cost over $175,000. General contract let to Ralph S. Herzog, 10 South Eighteenth Street. Irwin T. Catharine is architect for board. Bids asked until July 5 by Edward Merchant, secretary and business manager, for equipment and supplies for different public schools.

Commanding Officer, Frankford Arsenal, Philadelphia, asks bids until July 6 for one caliber 0.30 body annealing machine (Circular 513).

Board of Education, City Hall, Buffalo, James Storer, secretary, asks bids until July 12 for machinery and tools for sheet metal shop at warehouse and for other equipment.

SOUTH ATLANTIC

Department of Education, 3 East Twenty-fifth Street, Baltimore, Joshua R. Jolly, acting secretary, asks bids until July 6 for steel lockers, refrigerating machinery and other equipment for public schools.

Virginia-Carolina Fertilizer Corpn., Richmond, Va., is being formed to take over Virginia-Carolina Chemical Corpn., Richmond, and Armour Fertilizer Works, the latter heretofore a subsidiary of Armour & Co., Chicago, both manufacturers of commercial fertilizers. New organization will carry out improvements at various plants. Charles G. Wilson, heretofore president of Virginia-Carolina company, will be chairman of board; John E. Sanford, president Armour Fertilizer Works, will be president.

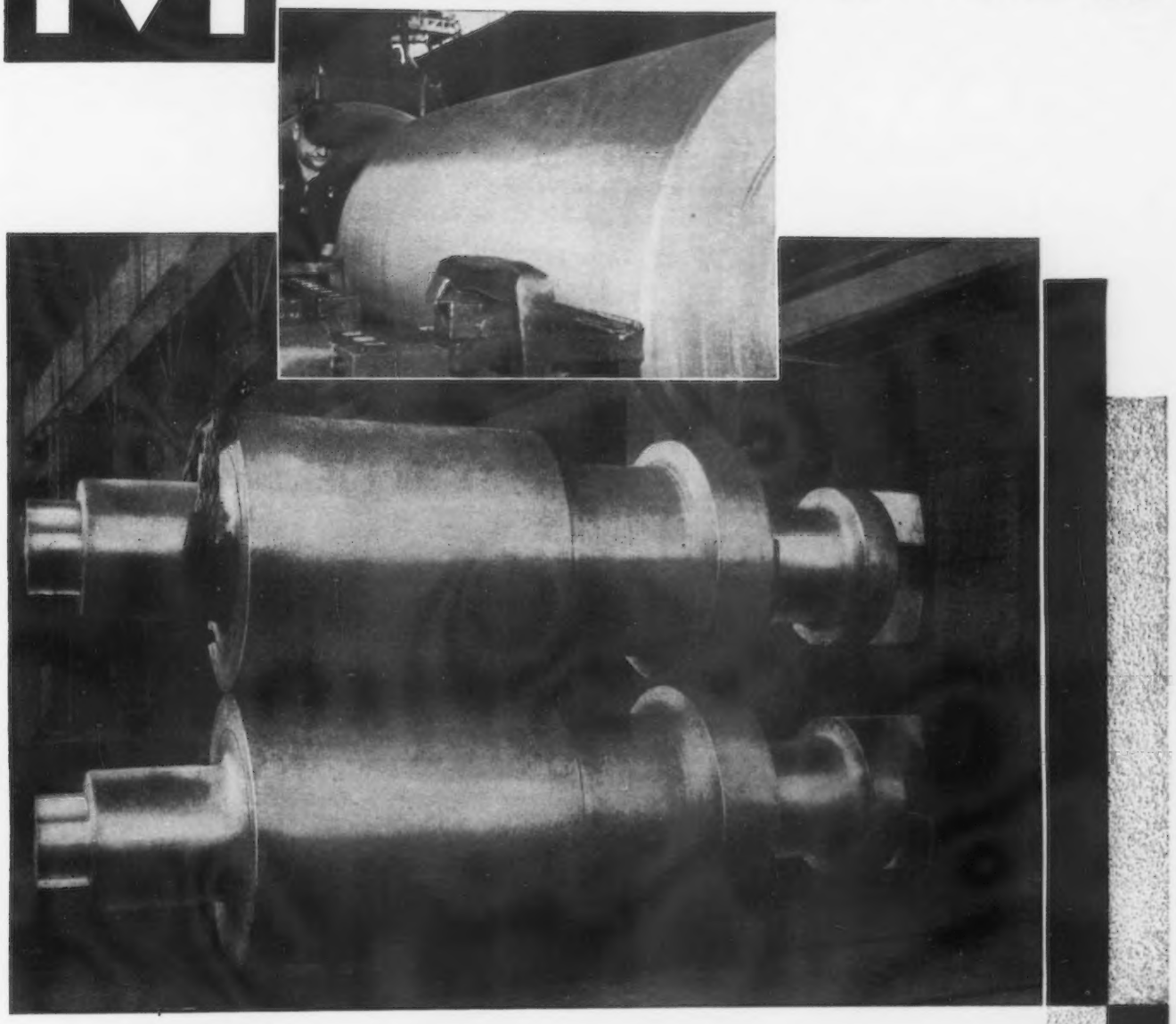
Construction Service, Veterans' Administration, Washington, asks bids until July 19 for steel rolling doors, steel stairs, steel shelving, incinerator unit and other equipment for new building at Togus, Me., for which bids on general contract, including boiler plant, are being asked at same time.

Board of Awards, Office of City Register, Baltimore, has asked bids on general contract for new hangar unit, with repair and reconditioning facilities at Logan Field, Baltimore County. An existing hangar will be razed. B. L. Crozier is chief engineer.

Seaboard Air Line Railway Co., Portsmouth, Va., is considering rebuilding part of engine house and machine repair shops at Raleigh, N. C., recently damaged by fire.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until July 5 for two motor-driven thread milling machines (Schedule 8310), two motor-generator sets, starter and regulator (Schedule 8285) for Washington Navy Yard; one upright drill (Schedule 8283), one die-sinking and engraving machine (Schedule 8282), metal and woodcutting machine (Schedule 8281), all motor driven; until July 12 one motor-driven drill grinder (Schedule 8308) and two motor-driven sheet metal cutting machines (Schedule 8309) for New York or San Francisco navy yards; until July 5 for one motor-driven brake press and power-operated squaring shear (Schedule 8263) for Pensacola Navy Yard; watertube high-pressure test boilers (Schedule 8260) for Mare Island and New York or San Francisco navy yards; electric arc-welding sets (Schedule 8271) for Eastern and Western yards; three motor-driven sheet metal forming machines (Schedule 8284) for Philadelphia, Hampton Roads, New York or San Francisco navy yards; until July 12 for pressure gages, vacuum gages, etc., compound and duplex

MESTA ROLLS



Chilled Rolls Alloy Iron Chilled Grain Rolls
Alloy Iron Fine Grain Rolls Sand Rolls
Mesta Hardened Rolls Mesta Hardened Chilled Rolls
Carbon Steel Rolls Alloy Steel Rolls
Mesta Special Alloy Steel Rolls Heat Treated

MESTA MACHINE COMPANY

Pittsburgh, Pa., U. S. A.

(Schedule 8299) for Eastern and Western yards.

Baltimore Incinerator Corpn., 2444 North Charles Street, Baltimore, has been organized by Leo B. Grifford and Frank Carozza, 2901 North Charles Street, to manufacture incinerator plant equipment.

Kelly-Springfield Tire Co., Cumberland, Md., is developing capacity schedule and has advanced production to 24-hr. day schedule, seven days a week, with increased working quota.

General Purchasing Officer, Panama Canal, Washington, asks bids until July 11 for parts for suction dredge, including cutter heads, cutter teeth and blade sheaths, electric fixture guards, electric water heaters, etc. (Schedule 2767).

B-J Aircraft Corpn., Dundalk, Md., a unit of North American Aviation Co., has secured contract from Navy Department for construction of new type of fighting plane, at cost of $98,000. Navy Department has right to purchase 28 similar aircraft units from company later, totaling about $700,000, if desired.

Capital City Machine Co. and C. L. Beale Welding Co. plants, occupying same building at Montgomery, Ala., were damaged by fire June 23.

CENTRAL DISTRICT

Pennzoil Co., 333 West Carson Street, Pittsburgh, a subsidiary of South Penn Oil Co., Chamber of Commerce Building, will carry out expansion at oil refinery at Oil City, Pa. Cost about $250,000 with equipment. Contract has been let to Arthur G. McKee & Co., Cleveland, for new cracking unit for gasoline department.

Nesbit Engineering Corpn., Pittsburgh, has been organized by E. C. and B. H. Smyers, Jr., 817 Heberton Avenue, to manufacture machinery and industrial equipment. A. F. Nesbit, Wilkinsburg, Pa., will be an official of company.

Penn Central Light & Power Co., Altoona, Pa., is acquiring Orrstown Light, Heat & Power Co., Orrstown, Pa., and will consolidate. Extensions in transmission lines are planned.

United States Engineer Office, Pittsburgh, will make improvements in lock and dam on Ohio River, near Emsworth, Pa., to cost about $50,000 with equipment.

Quaker State Oil Refining Co., Oil City, Pa., manufacturer of lubricating oils, etc., plans new blending plant at Toronto, Ont. Cost over $60,000 with equipment. Company is organizing a Canadian subsidiary to carry out project.

Brier Hill Coal Co., Kittanning Road, Butler, Pa., has approved plans for rebuilding part of coal tipple near Butler, recently destroyed by fire with loss of about $25,000. New unit will cost like amount.

Ohio Power Co., Newark, Ohio, has authorized new transmission line at Wellsville, Steubenville, Sebring, Ohio, and vicinity. Cost about $20,000.

Bastian-Blessing Co., 240 East Ontario Street, Chicago, manufacturer of soda fountains and parts, has purchased Russ Mfg. Co., Cleveland, manufacturer of kindred equipment. Purchasing company is organizing Russ Soda Fountain Co. of Ohio to operate Cleveland plant, where assembling will be largely concentrated in future. Chicago plant will be devoted primarily to parts production.

Superior Plating & Mfg. Co., Cleveland, care of Richard De Noble, Guardian Building, has been organized by John F. May and W. A. Grigsby, Cleveland, and associates to manufacture plated metal products.

Youngstown Steel Car Corpn., Niles, Ohio, is adding to production schedule with new lines of output, including heavy type automobile trailers, brake testing equipment and oil purifiers.

Kauffman-Lattimer Co., 263 North Front Street, Columbus, Ohio, manufacturer of laboratory equipment, is considering one-story addition. Cost about $25,000 with equipment.

White Motor Co., 842 East Seventy-ninth Street, Cleveland, manufacturer of motor trucks, is arranging for increased production and will give employment to about 3000 men in different departments. Company has secured order from Post Office Department, Washington, totaling about $1,500,000.

State Office Building Commission, 29 South Front Street, Columbus, Ohio, F. W. Mowrey, executive secretary, has awarded contract to United District Heating, Inc., 4400 Perkins Avenue, Cleveland, for installation of underground electric and steam transmission system from new State office building to State penitentiary, to cost about $100,000.

Val Decker Packing Co., Piqua, Ohio, meat packer, has awarded general contract to Green & Sawyer, Lima Trust Building, Lima, Ohio, for three-story and basement addition, including improvements in present factory. Cost over $60,000 with equipment. Anders & Reimers, Schofield Building, Cleveland, are architects.

Columbia Axle Co., 850 East Seventy-second Street, Cleveland, manufacturer of automobile axles, has increased production and is now giving employment to more than 250 men. Company recently received large orders from Auburn Automobile Co., Auburn, Ind.

C. & G. Foundry & Pattern Works, 1026 Kentucky Avenue, Indiananpolis, manufacturer of gray iron castings, etc., has awarded general contract to Serv-U-Well Construction Engineers, Inc., Architects and Builders Building, for new one-story foundry, 160 x 160 ft.

International Harvester Co., Chicago, has secured contract from United States Post Office Department, Washington, for 300 motor trucks, totaling about $224,520, and will carry out production at works at Fort Wayne, Ind., where operations will be increased.

Davidson Electric Motor Corpn., Evansville, Ind., has been organized by E. M. Davidson and John A. McDonald, Evansville, to manufacture electric motors and kindred products.

Heltonville Limestone Co., Heltonville, Ind., has awarded general contract to Bedford Foundry & Machine Co., Bedford, Ind., for one-story addition, 100 x 180 ft., for cutting, polishing, finishing, etc. Cost over $35,000 with equipment.

Indiana State Highway Commission, State House Annex, Indianapolis, Ind., asks bids until July 11 on general contract for one and two-story equipment storage, distributing and service building, 50 x 80 ft., near Anderson, Ind. Vonegut, Bohn & Mueller, Indiana Trust Building Indianapolis, are architects.

United Steel & Wire Co., Battle Creek, Mich., has increased production schedule from 16 to 24 hr. a day, with larger working quota. Company has secured large order from Kelvinator Corpn., Detroit, for steel shelves for electric refrigerator units.

City Council, Bessemer, Mich., is considering installation of a municipal electric light and power plant, using Diesel engine units. Transmission and distributing system will be built. Leo F. Mueller is city clerk.

Economy Tool Co., Detroit, has been organized by Leo H. Slipson, 12832 East Jefferson Avenue, and associates to manufacture tools and mechanical equipment.

Grand Rapids Gas Light Co., Grand Rapids, Mich., will carry out improvements at artificial gas plant, including installation of purifying equipment and accessories. Cost about $30,000.

Water Department, Ludington, Mich., has plans for extensions and improvements in power plant, including installation of engines, boilers and auxiliary equipment. Francis Engineering Co., Saginaw, Mich., is consulting engineer.

Sparta Foundry Co., Sparta, Mich., has increased production schedule to five and one-half days a week, giving employment to larger working force. Considerable part of output is being given over to piston rings for automobile engines, for which company recently secured large contract.

Machine Specialty Co., Ann Arbor, Mich., manufacturer of wrist pins, dowel pins and kindred specialties for automobile engines, has advanced production schedule and is now operating two departments on 24-hr. day basis and one division on three-hr. overtime night schedule.

General Fire Equipment Corpn., Detroit, has been organized by Arthur A. Morris, 3501 Barlum Tower Building, and associates to manufacture fire protection devices and equipment.

SOUTH CENTRAL

United States Engineer Office, Memphis, Tenn., asks bids until July 5 for two 20-kw. gasoline-engine-driven generating sets (Circular 726).

Goodyear Tire & Rubber Co., Gadsden, Ala., has increased production schedule at local mill with larger working force and is now operating on five-day week basis.

Constructing Quartermaster, Barksdale Field, Shreveport, La., asks bids until July 7 for electrical conduits, air and water service lines, etc., at local field, entire work to cost about $80,000; also for erection of 24 garages and service units.

Lexington Utilities Co., Lexington, Ky., plans rebuilding part of power plant recently damaged by fire. Loss about $50,000 with equipment.

Smith & Young, Somerset, Ky., plan purchase of pipe for gas plant and distributing service, including natural and artificial gas.

City Council, Bowling Green, Ky., asks bids until July 15 for pipe and other equipment for lateral sewage system. Cost $85,000. J. N. Chester Engineers, Inc., Clark Building, Pittsburgh, Pa., is consulting engineer.

SOUTHWEST

Board of Public Utilities, City Hall, Kansas City, Kan., C. A. Lowder, secretary, plans early call for bids for boiler feed pumping machinery and accessories for municipal electric light and power plant. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is consulting engineer.

American Airways, Inc., New York, and Lambert Field, St. Louis, has arranged with city for 25-year lease of property at last noted airport and will concentrate operations largely at that point, removing headquarters from New York to that place. Cincinnati division, also, will be transferred there and centralization program carried out. Main repair and operating mechanical departments will be established at Lambert Field.

Scott-Newcomb, Inc., 1922 Pine Street, St. Louis, Louis L. Scott, president, recently organized, will manufacture oil burners and oil burning equipment. Company is also planning establishment of department for production of air-conditioning equipment for domestic service.

Board of Works, Wichita, Kan., plans rebuilding hangars and other buildings at municipal airport, recently destroyed by a tornado. Loss over $75,000 with equipment.

Treasury Department, Washington, James A. Wetmore, acting supervising architect, plans early call for bids for new water system at Southwestern Reformatory, near El Reno, Okla., to include 200,000-gal. steel tank and tower. Hawk & Parr, Hales Building, Oklahoma City, Okla., are architects.

General Utilities Gas Co., Liberty, Mo., operating gas plants and systems, has been purchased at a receiver's sale by C. O. Moore, president, Kansas Communities Gas Co., and associates for $310,000. New owners plan extensions and improvements, including pipe lines.

American Body & Equipment Co., Dallas, Tex., has been organized by A. A. and Homer Ritcheson, Dallas, and associates to manufacture automobile bodies and equipment.

Chickasha Cotton Oil Co., Chickasha, Okla., has plans for branch plant near Wellington, Tex. Cost close to $25,000 with equipment.

International Iron & Supply Co., Houston, Tex., has been organized by Nathan Gitler, Houston, and associates to manufacture iron and metal products.

MIDDLE WEST

City Council, Springfield, Ill., contemplates early call for bids for pumping machinery for waterworks. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is consulting engineer.

United States Engineer Office, Rock Island, Ill., asks bids until Aug. 3 for lock-operating machinery, power house machinery and complete electrical control system for locks and dam at Mississippi River lock and dam No. 15, Rock Island (Circular 168).

Majestic Rolling Door Co., 3354 Grand Avenue, Chicago, has been organized by W. J. Kellogg and associates to manufacture steel rolling doors and other fireproof building products.

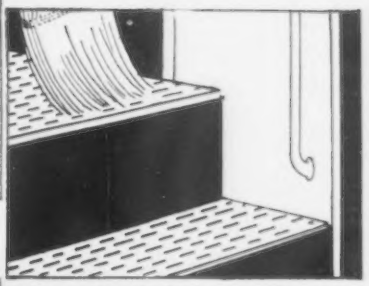
City Council, Marshall, Minn., H. N. Harmon, clerk, asks bids until July 14 for equipment for municipal electric light and power plant, including one Diesel engine-generator unit, auxiliary power equipment, switchboard and crane, etc. G. M. Orr & Co., Minneapolis, are consulting engineers.

Quality Gas & Oil Co., Keokuk, Iowa, J. A. Cochrane, head, plans extensions and improvements in oil storage and distributing plant, including installation of tanks and auxiliary equipment.

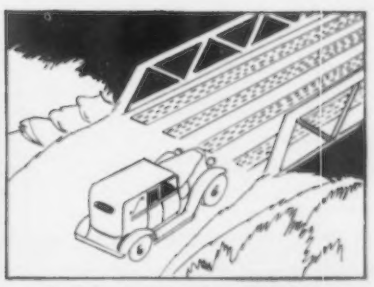
Construction Service, Veteran's Administration, Washington, asks bids until July 26 for

Makes every step sure-footed

ILLINOIS FLOOR PLATE



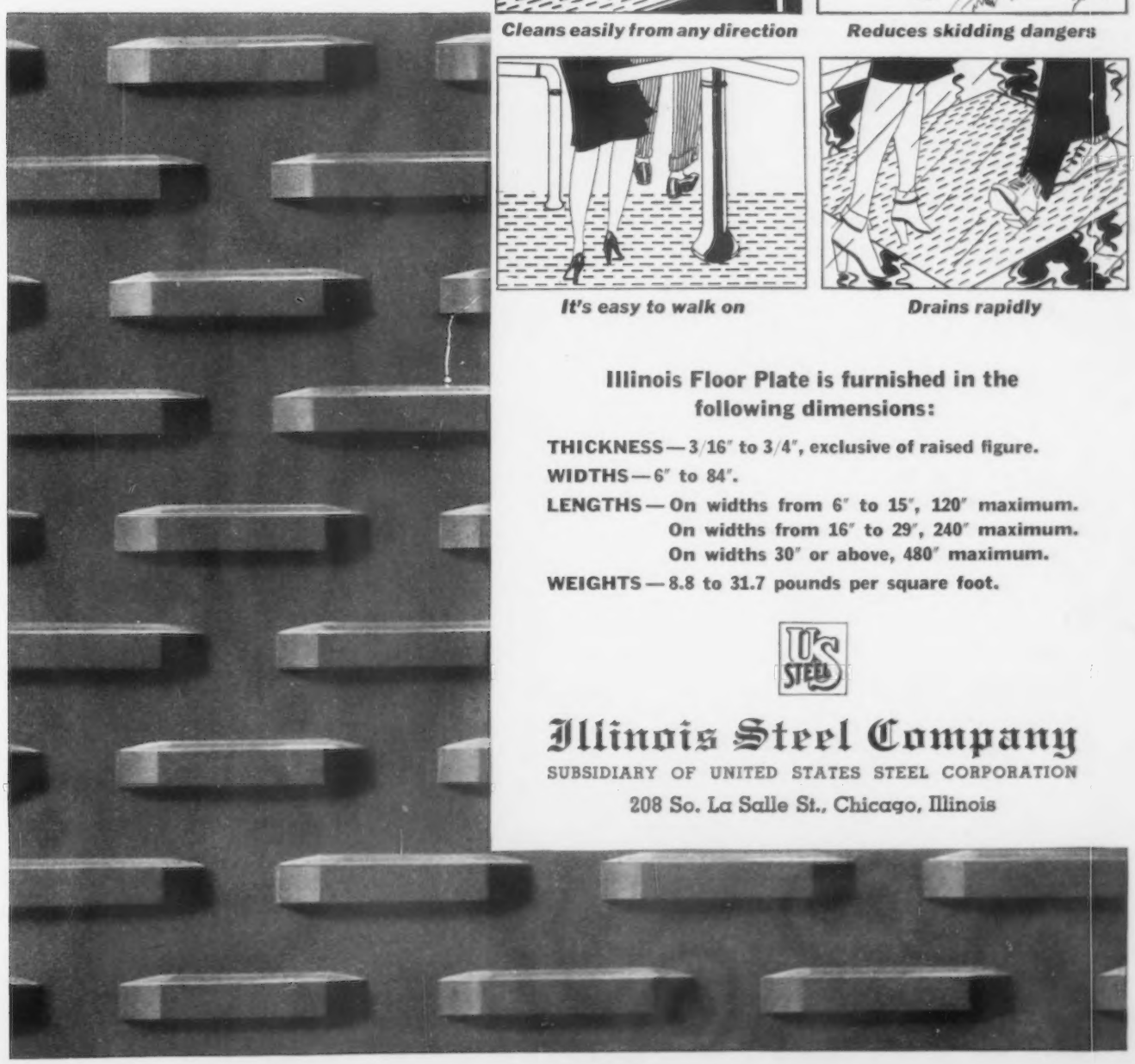
Cleans easily from any direction



Reduces skidding dangers

It's easy to walk on

Drains rapidly



Illinois Floor Plate is furnished in the following dimensions:

THICKNESS—3/16″ to 3/4″, exclusive of raised figure.
WIDTHS—6″ to 84″.
LENGTHS—On widths from 6″ to 15″, 120″ maximum.
On widths from 16″ to 29″, 240″ maximum.
On widths 30″ or above, 480″ maximum.
WEIGHTS—8.8 to 31.7 pounds per square foot.

U·S STEEL

Illinois Steel Company
SUBSIDIARY OF UNITED STATES STEEL CORPORATION
208 So. La Salle St., Chicago, Illinois

steel stairs, steel shelving and partitions, steel sash and other iron and steel equipment for building at St. Cloud, Minn.

Laramie Tool & Die Works, Inc., 1215 South Fifty-second Street, Cicero, Chicago, has been organized by John and Joseph S. Jenia, and associates, to manufacture tools, dies and kindred specialties.

City Council, Ralston, Neb., has authorized plans for a municipal electric light and power plant. Cost over $60,000 with equipment. C. V. Barnhill, Federal Trust Building, Lincoln, Neb., is consulting engineer.

Milwaukee Road, 516 West Jackson Boulevard, Chicago, has awarded general contract to Phelps-Drake Co., Metropolitan Life Building, Minneapolis, for new engine house and machine repair shop at Mitchell, S. D.

Bowen & Mowat Mfg. Co., 54 Dexter Avenue, Elgin, Ill., has been organized by Daniel J. Bowen and John W. Mowat, Elgin, to manufacture heaters and kindred equipment.

Steel Treating Materials Co., Milwaukee, has been incorporated to manufacture machinery and materials for treating metals. Principal is Raymond Thiessenhusen, 6012 Grand Avenue, Wauwatosa, Wis., long associated with Wesley Steel Treating Co., Milwaukee.

Modine Mfg. Co., Racine, Wis., manufacturer of automobile radiators, space heaters, etc., is placing in production new electrically operated device for cooling homes in hot weather.

Common Council, Portage, Wis., closed bids June 19 for construction and equipment of $60,000 sewage treatment plant designed by Pearse, Greeley & Hansen, 6 North Michigan Avenue, Chicago. H. V. Tennant is city engineer.

◀ PACIFIC COAST ▶

City Purchasing Agent, Thomas Oughton, City Hall, Los Angeles, asks bids until Aug. 2 for steam turbine electric generator unit, 81,250 kva. capacity, and auxiliary equipment for municipal power plant (Specifications 2827).

Kern County Union High School District, Bakersfield, Cal., asks bids until July 5 for steel water tank and tower. Charles H. Biggar, Haberfelde Building, is architect.

Essick Machinery Co., Los Angeles, has been organized by Newman Essick, 3710 Effingham Place, and associates, to manufacture machinery and other mechanical equipment.

Swift & Co., Chicago, and 3750 Jewel Street, Vernon, Cal., meat packer, have awarded general contract to Lynch Construction Co., 730 Gage Avenue, Los Angeles, for two-story top addition, 38 x 57 ft., and new two-story main addition, 76 x 113 ft., to refinery at Vernon. Cost about $85,000 with equipment.

Superintendent, Phoenix Indian School, Phoenix, Ariz., asks bids until July 11 for one 150-hp. watertube steam boiler for power house.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until July 5 for three motor-driven heavy duty engine lathes (Schedule 8276) for San Diego Navy Yard; until July 12 for one 55-ft., 30-ton capacity flat car (Schedule 8298) for Puget Sound Navy Yard.

Southern California Edison Co., 601 West Fifth Street, Los Angeles, has approved plans for extensions and improvements in power substation at San Bernardino, Cal., including installation of equipment to change operation from manual to automatic control.

State Board of Control, Salem, Ore., is considering call for bids for a 250-hp. boiler unit and auxiliary equipment for State penitentiary power house.

Carl M. Einhart, 279 East Foothill Boulevard, Arcadia, Cal., is at head of project to build a carbon dioxide dry-ice manufacturing plant in Imperial Valley district, securing brine from Salton Sea. Site is being secured near Niland, Cal. Cost over $50,000 with equipment, including pumping and power machinery. Company will be organized to carry out development.

◀ NEW ENGLAND ▶

Barrett Co., 40 Rector Street, New York, and Everett, Mass., manufacturer of roofing products, road materials, etc., has plans for initial units of new works on 14-acre site at Malden, Mass. Cost over $150,000 with machinery. Other structures will be built later. Everett plant will be removed to new location. P. J. Passen, New York address, is company engineer in charge.

Jenney Mfg. Co., 8 India Street, Boston, manufacturer of oil products, with refining plant on First Street, is planning expansion and improvements.

E. M. Dart Mfg. Co., Providence, R. I., has been organized to take over and expand company of same name, with plant on Thurbers Avenue, manufacturer of pipe unions, flanges, fittings, etc. J. Milton Goff and George B. Champlin are principal incorporators of new company.

Victory Yacht Yards, Inc., Squantum, Boston, sustained loss of over $600,000 in fire June 22 which destroyed portion of plant, comprising part of former Victory shipyard of Government, occupied under lease by first noted company.

Maxson Automatic Machinery Co., Westerly, R. I., has been organized by Julian W. and Charles B. Maxson, 14 Maple Street, to manufacture automatic machinery and parts.

◀ FOREIGN ▶

Auto-Union, A. G., Chemnitz, Saxony, Germany, has been organized with capital of 14,500,000 m. (about $3,480,000) to take over three large manufacturers of motor vehicles in that district, including Zschoppauer Motorenwerke, D. K. W., manufacturer of popular priced small automobiles, motorcycles, parts, etc., Audi Werke, manufacturer of eight-cylinder automobiles, and Horch, A. G., also manufacturer of eight-cylinder cars. New company will carry out expansion and has leased plant of Wanderer Werke, in same district, manufacturer of four and six-cylinder automobiles, and will occupy in part for new production. Last noted company will remain independent of consolidated interests.

British Copper Refiners, Ltd., London, England, recently organized by officials of British Insulated Cables, Inc., London, and Roan Antelope Copper Mines, Ltd., same place, is planning erection of a new copper refinery near Liverpool, securing raw material from mines of last noted company in northern Rhodesia. Cost over $1,500,000 with machinery.

Further Decline in Machinery Exports; Imports Slightly Higher

WASHINGTON, June 28.—Further decline of machinery exports was reflected in the May total, which was $11,278,000 compared with $12,233,000 in April. Exports of industrial machinery, as classified by the Division of Statistics, Department of Commerce, made a slight gain to $5,338,000 from $5,191,000.

An increase of less than $5,000 was made in machinery imports, valued at $646,152, as against $641,464 in April.

Imports of Machinery Into the United States

(By Value)

	May		Five Months Ended May	
	1932	1931	1932	1931
Metal-working machine tools	$17,989	$20,478	$89,870	$105,401
Agricultural machinery and implements	160,622	258,881	544,454	2,282,943
Electrical machinery and apparatus	169,210	235,728	784,861	1,020,385
Other power-generating machinery	40,667	37,035	141,185	133,517
Other industrial machinery	221,153	432,153	1,954,632	2,042,843
Automobiles and other vehicles, except agricultural	36,511	174,820	269,439	1,591,177
Total	$646,152	$1,159,095	$3,784,441	$7,176,266

Machinery Exports

(By Value in Thousands of Dollars)

	May		Five Months Ended May	
	1932	1931	1932	1931
Locomotives	....	$35	$107	$90
Other steam engines	$15	17	63	150
Boilers	31	44	59	169
Accessories and parts	87	14	31	216
Automobile engines	314	362	1,234	1,543
Other internal combustion engines	290	599	836	1,827
Accessories and parts for	117	189	569	1,059
Electric locomotives	261	99	305	309
Other electric machinery and apparatus	267	384	1,228	2,079
Excavating machinery	362	265	840	1,465
Concrete mixers	1	55	25	367
Road making machinery	22	201	114	662
Elevators and elevator machinery	184	259	524	1,413
Mining and quarrying machinery	309	896	787	5,055
Oil well machinery	427	648	1,941	5,767
Pumps	151	421	806	1,618
Bending and power presses	159	333	555	1,703
Forging machinery	114	184	547	1,621
Machine tools	484	2,281	3,721	11,537
Other metal-working machinery and parts of	188	277	1,008	1,617
Textile machinery	396	722	2,217	3,048
Sewing machines	269	343	1,875	18,847
Shoe machinery	44	95	283	475
Flour-mill and gristmill machinery	7	21	43	151
Sugar-mill machinery	51	47	262	386
Paper and pulp mill machinery	58	124	266	637
Sawmill machinery	10	72	114	273
Other woodworking machinery	21	104	100	501
Refrigerating and ice making machinery	30	119	166	766
Air compressors	150	197	703	919
Typewriters	411	867	2,779	4,768
Power laundry machinery	8	49	115	410
Typesetting machines	85	291	428	1,149
Printing presses	95	276	575	1,129
Agricultural machinery and implements	708	2,490	4,718	47,981
All other machinery and parts	5,152	13,114	32,178	46,453
Total	$11,278	$26,494	$62,122	$168,160

FOR WELDING JOBS *that demand* SAFETY PLUS

Where weld safety must be a certainty, Roebling Welding Wire is used to great advantage. It is a *special* wire which, because of its purity and uniformity, *consistently* produces welds that are exceptionally strong and durable.

Naturally, this Roebling Wire is not made on the ordinary tonnage basis. Like the fine wire used for Roebling Bridge Cables and Wire Rope, it is made of pure metals and in *small* open-hearth furnaces that permit close control of the melt and exact refining.

Write to our nearest office below for samples of this welding wire. Convince yourself of its merit. It is made in both gas and electric types.

JOHN A. ROEBLING'S SONS CO. - TRENTON, N. J.
Atlanta Boston Chicago Cleveland Los Angeles New York Philadelphia Portland, Ore. San Francisco Seattle Export Dept, New York, N. Y.

WHY ROEBLING WELDING WIRE IS OF EXCEPTIONALLY HIGH QUALITY...

1. It is a custom-made wire; 2. the steel for it is not made on the ordinary tonnage basis; 3. it is made in small open-hearth furnaces; 4. of special melting stock; 5. and is produced by Roebling's special methods; 6. painstaking care is exercised throughout manufacture.

ROEBLING

THE CUSTOM-MADE WELDING WIRE—FOR EXACTING WELDERS

Testing Society Holds Annual Meeting at Atlantic City

(*Continued from page* 1396)

Co., New York, emphasized that the work of the past year was done under unusually difficult circumstances and expressed his thanks and that of the society for the cooperative and faithful work of the members.

Supplementing the notable symposium on this subject held in Chicago a year ago, Mr. French listed several projects which, since then, have been carried far enough to justify detailed reports. Among these are: Correlation of tension, creep and fatigue properties of low-carbon (0.17 per cent) boiler steel at elevated temperatures; a cooperative study of the notched-bar impact properties, magnetic properties and structure of the 18-8 rustless steels under different conditions of treatment, supplemented by a metallographic study of these materials; and a critical survey of the variations and variables in cooperative creep testing of a Cr-Mo steel, containing 0.40 per cent carbon, about 0.90 chromium and 0.50 molybdenum. These various reports were abstracted by Dr. H. W. Gillett, P. G. McVetty and N. L. Mochel. The year's work, if printed, will cover about 100 pages.

An important announcement was that the committee now has in hand over $9,000 of a $20,000 fund needed to carry out proposed activities, such as an investigation of the endurance properties of austenitic Ni-Cr steels at different temperatures under Prof. H. F. Moore, University of Illinois, which will be coordinated with creep tests at the Battelle Memorial Institute under Dr. H. W. Gillett, as well as studies at various industrial laboratories relating to the structural stability of these steels and the changes in various properties with time at high temperatures. The importance of the work of this committee, as it relates to industry and to consumers of metals at high temperature, cannot be too strongly emphasized.

Valuable information was contained in the report of the research committee on fatigue of metals, Prof. H. F. Moore, chairman, which contained additions to the summary of present-day knowledge of fatigue of metals, presented by this committee in 1930, in the form of short articles on corrosion-fatigue and the significance and limitations of fatigue test results.

Papers on Tool Steel and Other Subjects

One of several interesting papers presented during the week was "A Correlation of Some Mechanical and Magnetic Properties of 1.21 Per Cent Carbon Tool Steel" by J. V. Emmons and R. L. Sanford, metallurgist, Cleveland Twist Drill Co., Cleveland, and chief, magnetic section, United States Bureau of Standards, Washington, respectively. The authors state that six materially different properties were measured, three mechanical and three magnetic. An outstanding conclusion is that each property has its own individuality, which is distinct from that of the other properties. Relationships between the several properties may be for only a limited range of heat treatments, indicating that the changes taking place during such treatments are very complex. No conclusion should be drawn that magnetic analysis is of no value, but only that it should be applied with a full knowledge of its limitations.

In a paper, "The Testing of Rope Wire and Wire Rope" by A. V. de Forest and L. W. Hopkins, consulting engineer, American Cable Co., Inc., and materials engineer, Page Steel & Wire Co., Bridgeport, Conn., respectively, the authors describe a few of the test methods applied by them to wire and wire rope with typical applications of resultant test data. Suitable test methods can be used to raise the general level of rope performance by improvement of the quality of component parts, say the authors.

Two papers dealt with large testing machines: "An Automatic Autographic Extensometer for Use in Tension Tests of Materials" by R. L. Templin, chief engineer of tests, Aluminum Co. of America, New Kensington, Pa., and "Full-Load Calibration of a 600,000-lb. Testing Machine" by Prof. H. F. Moore, University of Illinois and two associates. The machine calibrated had been in severe service use for 27 years and was found still to have a high degree of accuracy and sensitivity. The extensometer, described by Mr. Templin, was developed to meet a demand for an inexpensive, accurate method for determining yield strengths of materials in routine tension tests.

Another valuable paper was "Mechanism of Deformations in Gray Iron" by J. W. Bolton, chief chemist and metallurgist, the Lunkenheimer Co., Cincinnati.

Steel Casting Symposium Brings Out Many Facts

CARRYING out a program arranged some time ago for a series of symposiums on castings in cooperation with the American Foundrymen's Association, one on steel castings was put through this year. A year ago, the first one, devoted to malleable castings, was a feature of the convention in Chicago. A third symposium, devoted to gray iron, is scheduled for next year's convention at Chicago.

The program on steel castings oc-

H. S. Taylor

C. A. Menzel

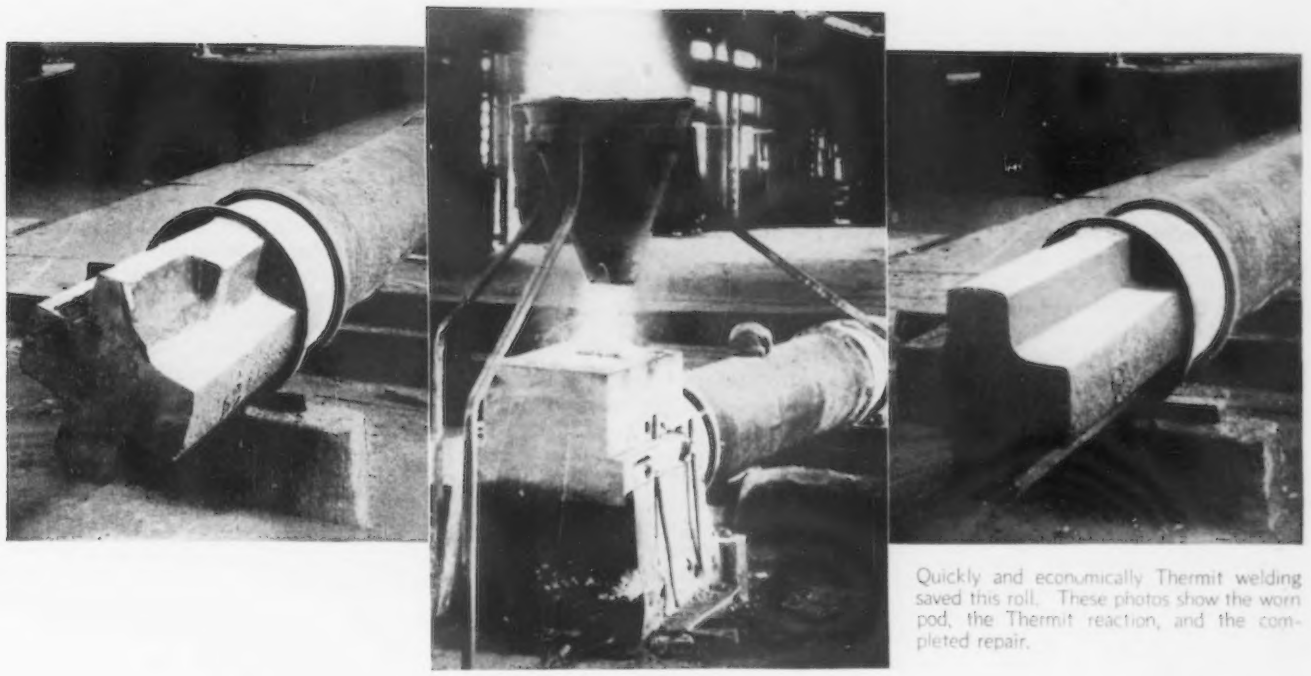
PROFESSOR TAYLOR delivered the seventh annual Edgar Marburg lecture. Mr. Menzel was awarded the Charles B. Dudley medal.

▲ ▲ ▲

MR. CHAPMAN, New York consulting engineer, was promoted from the vice-presidency to the presidency for 1932-1933. Mr. Bassett, prominent in non-ferrous metallurgy, was elected vice-president.

Cloyd M. Chapman

W. H. Bassett



Quickly and economically Thermit welding saved this roll. These photos show the worn pod, the Thermit reaction, and the completed repair.

Reclaim the part

and save the difference

That's what you do when you Thermit weld.

You reclaim the part and return it to service without delay for added years of usefulness. Because a Thermit weld is sound. Its physical properties are almost invariably superior to those of the parent metal.

The difference saved can be figured by subtracting the cost of Thermit welding from the cost of making a replacement. This may be 50 per cent, or as much as 85 per cent.

The economy of Thermit welding is being demonstrated almost daily in steel mills and large industrial plants. Thermit welding has become a routine of the maintenance and reclamation departments. Worn wobbler ends and pinions are quickly built up. Broken mill rolls, housings, press heads and other parts are permanently repaired.

Write for booklet containing details of methods and numerous applications.

METAL & THERMIT CORPORATION, 120 BROADWAY, NEW YORK, N.Y.

ALBANY PITTSBURGH CHICAGO SOUTH SAN FRANCISCO TORONTO

THERMIT WELDING

M and T products include numerous alloys and special metals — pure chromium, pure manganese, pure tungsten, ferro-titanium, ferro-vanadium, ferro-tungsten, manganese copper, manganese titanium, manganese-boron, cobalt copper, pig tin, detinned billets.

cupied two sessions, one in the afternoon of June 21, devoted to general topics, and one in the evening, principally involving alloy castings and heat treatment. There were 10 papers in the symposium, organized under the chairmanship of W. C. Hamilton, research director, American Steel Foundries, East Chicago, Ind.

As an introduction, Mr. Hamilton read a paper, "General Survey of the Steel Castings Industry." This was followed by an excellent presentation of "Statistical Data on Steel Casting Production in the United States" by G. P. Rogers, managing director, Steel Founders Society of America.

Design a Vital Matter

One of the most important subjects was introduced in a paper by F. A. Lorenz, Jr., general manager, industrial division, American Steel Foundries, Chicago, entitled, "Notes on the Design of Steel Castings." There is a tendency among foundrymen to devote their energies to the production of designs as submitted without bringing to the attention of the engineers the features which impose high producton costs, said the author. This failure leaves the designer ignorant of economies which could be effected. The weight of a casting does not in direct proportion affect its cost of production. The greatest single influence is the degree of intricacy of design. Many of the factors influencing design were discussed by Mr. Lorenz.

There was sincere approval of the paper by several commentators, who emphasized the necessity for cooperation between designer and foundryman and the education of both to this end. P. E. McKinney, Bethlehem Steel Co., Bethlehem, Pa., stated that design is important in the success or failure of a casting in service. Prof. H. F. Moore, University of Illinois, who presided at the first session, urged more cooperation between the draftsman and foundryman. And in the remarks of speakers on subsequent papers, this topic often came to the surface.

Test Bars and Specifications

Another valuable paper of the first session was "Purchase Requirements for Steel Castings with Notes on Physical Properties in Test Bars and in Commercial Castings," by R. A. Bull, director, Electric Steel Founders' Research Group, Chicago.

An important point brought out by Major Bull in his paper of some 30 printed pages is that certain factors are not fully understood by consumers regarding the manner in which the member of a casting generally influences its physical properties as determined by laboratory tests. Much work has been done, says the author, in the effort to determine the influence of thickness on such properties as yield point, ultimate strength elongation, etc. Mass is a highly important factor in any metal product influencing its resistance to stresses and the speed with which the metal cools.

An interesting portion of Major Bull's paper is his abstracts of some 34 specifications for steel castings, together with his convictions regarding certain chemical limitations, pointing out the undesirability of low limits for silicon and manganese.

Comments which followed brought out the fact that there are many cases in which the test bar does not represent the casting, due to mass action, and that there are often rejections of material which should not take place. Prof. Bradley Stroughton, Lehigh University, said that Major Bull had brought out many facts showing the desirability of fewer limits in specifications. Floyd Olcott, Bureau of Construction and Repair, United States Navy, Washington, representing a consumer, said that often the properties of a material are demanded and not composition in the Navy specifications. He also said that design in hull castings was sometimes embarrassing and resulted in loss of the casting. He made a plea for cooperation between designer and consumer.

Correlated Data on Alloy Castings

A splendid paper, not preprinted, was that of C. H. Lorig and C. E. Williams, Battelle Memorial Institute, Columbus, Ohio, on "Physical and Mechanical Properties of Cast Steels." The data as analyzed are taken from many sources and put in order. They show the properties of several plain-carbon and alloy cast steels, including medium-manganese, silicon, copper, nickel, molybdenum and vanadium, as alloys singly or in combination. Mention was made particularly of the value of copper as an alloy as developed in quite recent years and of molybdenum. The latter was cited as greatly increasing the yield point at high temperatures and as augmenting the air-hardening properties. The paper correlates in a valuable way the present information on plain-carbon, simple and complex alloy steel castings.

Modern Alloy Steel Castings

At the second session, which was presided over by Dr. Zay Jeffries, there were three papers covering the development of alloy steels for castings: "Representative Properties of Cast Medium Pearlitic Steels" by Fred Grotts, metallurgical engineer, Continental Roll & Steel Foundry Co., East Chicago, Ind.; "Castings of Corrosion-Resistant Steels" by Jerome Strauss, Vanadium Corpn. of America, Bridgeville, Pa., and "Austenitic Manganese Steel Castings" by John Howe Hall, Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

Pearlitic steels are those composed chiefly of pearlite when in the normalized condition, said Mr. Grotts in his paper which is replete with statistical data in 17 tables showing the properties of such carbon and alloy steels. The data are contributed by foundries regularly producing the various steels and were not obtained from heats made for experimental purposes. The data reveal the many excellent physical properties, including Izod impact values which have been obtained from pearlitic manganese steels (Mn 1.05 to 3 per cent with carbon 0.30 to 0.40 per cent) with or without the use of alloys such as nickel, chromium, vanadium, molybdenum, etc. To obtain the best results special heat treatments are essential and for most of the steels these are given in the paper.

Attention was called by P. E. McKinney to the danger of relying too much on definite results in some cases from the alloy steels, due to mass action. Some of the properties cited cannot always be realized in castings of large mass.

Many Corrosion-Resistant Alloys

The lack of definite information regarding the properties of the many complex alloys in castings of corrosion-resistant steels was clearly brought out by Jerome Strauss in his paper. The listener was left with the impression that there is a maze of possible combinations of chromium and iron; chromium, nickel and iron and so on, many of them now in use either as castings or wrought products, concerning which much information is necessary. Factors which influence the properties desired are the conditions which the castings are to meet, and these are many.

The familiar and latest properties of Hadfield's manganese steel were forcibly and convincingly presented by Mr. Hall in his paper. Answering a few questions, Mr. Hall made the statement that his company had lately developed a successful method of welding manganese steel to high-carbon steel such as rails.

Results Achieved by Heat Treatment

An excellent paper on "Problems and Practices in the Heat Treatment of Steel Castings" by A. W. Lorenz, metallurgist, Bucyrus-Erie Co., South Milwaukee, Wis., covered the latest information on this subject. The author confined himself largely to carbon steel castings and brought out the high tensile strengths obtainable from even liquid quenching, results often comparable with those obtainable from some alloy castings. A striking statement was that liquid quenching of alloy steel castings is capable of developing ultimate strength and yield point characteristics at least 50 per cent higher than those typical of the metal in the normalized condition without appreciable loss of ductility.

The symposium was concluded with a paper "Fusion Welding As Related to Steel Castings" by T. S. Quinn, treasurer, Lebanon Steel Foundry Co., Lebanon, Pa.